GE Fanuc Automation

CIMPLICITY Systems Products

CIMPLICITY® Display Station

User's Manual

GFK-1220B *February 1997*

Warnings, Cautions, and Notes as Used in this Publication

Warning

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

Caution

Caution notices are used where equipment might be damaged if care is not taken.

Note

Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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PowerTRAC	Genius PowerTRAC	Series Five	VuMaster
CIMPLICITY 90–ADS	Helpmate	Series 90	Workmaster
CIMSTAR	Logicmaster		

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CIMPLICITY Display Station Products

This manual provides operating information for the following CIMPLICITY Display Station products: Touch Display (IC751ATS200 and IC751ATS350), Touch Station (IC751BTS200, IC751BTS300 and IC751BTS350), and Glide Station (IC751BGP200 and IC751BGP300).

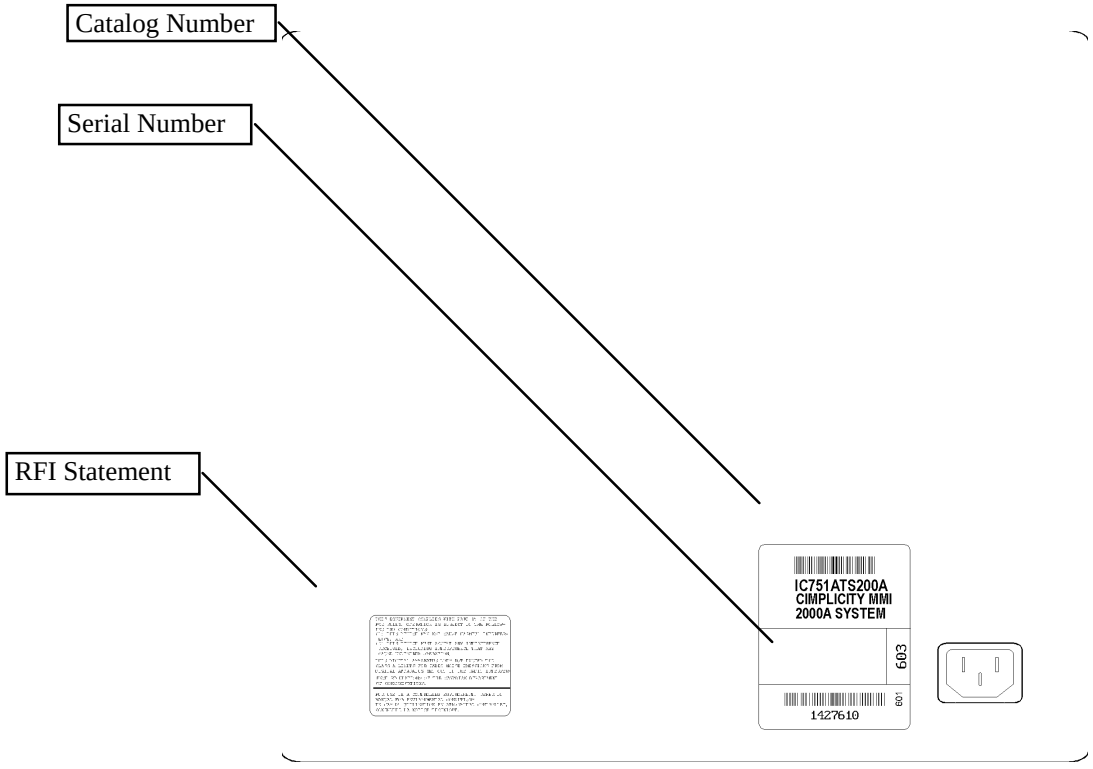
The following information should be recorded and retained for future reference. The catalog and serial numbers are located on the back of the unit enclosure (see sketch below). This information is also provided on the data sheet provided with your Display Station product. *Keep* the data sheet, because it contains additional important information about the Display Station product.

Product name: _____
(Touch Display, Touch Station, Glide Station)

Catalog Number: IC_____

Serial Number: _____

Date of Purchase:_____



Revisions to This Manual

Changes made in this revision (GFK-1220B) describe new features of the CIMPLICITY Display Station system. Additionally, corrections have been made where necessary. The following list describes the major revisions in this manual, as compared to the previous version (GFK-1220A).

- The Display Station products now incorporate release 3.0 CIMPLICITY MES/SCADA and HMI for Windows® software and either Microsoft® Windows® 95 **or** Microsoft Windows NT® software (depending on model). (Chapter 4)
- Mounting hole dimensions drawing for Touch Station and Glide Station units has been revised to show correct center-to-center distance between holes of 11.25" (27.94mm). (Figure 2-6)
- Phone numbers for Customer Support have been revised (Chapter 1).

Content of This Manual

Chapter 1. **Introduction:** Presents an overview of the CIMPLICITY Display Station system.

Chapter 2. **Getting Started:** Provides basic information needed to install your CIMPLICITY Display Station system and get it running.

Chapter 3. **Copying a CIMPLICITY Project to a Runtime System:** Provides instructions for copying a project from the CIMPLICITY configuration cabinet.

Chapter 4. **Running CIMPLICITY Software:** Provides an overview of essential tasks performed with CIMPLICITY software.

Chapter 5. **Installing Memory Upgrades:** Provides instructions for upgrading the Display Station memory.

Chapter 6. **System Operation:** Presents details pertaining to the operation of specific Display Station features that are not covered in Chapter 2.

Chapter 7. **SNP Device Communications:** Describes hardware setup for Series 90 Protocol (SNP) communications between the Display Station and a Series 90 PLC.

Chapter 8. **TCP/IP Communications:** Describes hardware setup for TCP/IP communications between the Display Station and a Series 90 PLC.

Chapter 9. **MODBUS RTU Device Communications:** Describes how to set up multidrop communications using the MODBUS RTU protocol.

Chapter 10. **Diagnostics and Troubleshooting:** Describes self-test diagnostics. Provides troubleshooting tables organized by symptom.

Appendix A. **Port Configuration and Cabling:** Provides port configuration and cable assembly information for the CIMPLICITY Display Station products.

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Appendix B. **Computer Setup:** Provides listings of the default settings as the CIMPLICITY Display Station was configured from the factory. Instructions for infrequently performed computer setup tasks are also provided.

Appendix C. **Customizing Network Settings:** Provides setup information for Display Station communications.

Appendix D. **Interrupt Requests:** Provides a table of IRQ assignments.

Appendix E. **Software System Overview:** Describes the software that is bundled with the CIMPLICITY Display Station.

Appendix F. **Specifications:** Summarizes the design, electrical, and physical specifications of the CIMPLICITY Display Station products.

All of the products and features referenced in this manual may not be available when this manual is printed. For current availability of features and products, consult your local GE Fanuc distributor or GE Fanuc sales representative.

Related Publications

GFK-1221	*CIMPLICITY® Display Station Products Important Product Information*
GFK-1189	*CIMPLICITY® HMI for Windows NT™ and Windows® 95 Important Product Information*
GFK-1180	*CIMPLICITY® HMI for Windows NT™/CIMPLICITY HMI for Windows® 95/CIMPLICITY Server for Windows NT™ Base System User Manual*
GFK-1181	*CIMPLICITY® HMI for Windows NT™/CIMPLICITY HMI for Windows® 95/CIMPLICITY Server for Windows NT™ Device Communications Manual*
GFK-1134	*CIMPLICITY® HMI for Windows NT™ Event Manager API Open Architecture Application Developer Guide*
GFK-1201	*CIMPLICITY® HMI for Windows NT™/Windows® 95/Server for Windows NT Point Management API Application Developer Guide*
GFK-1202	*CIMPLICITY® HMI for Windows NT™/Windows® 95/Server for Windows NT Device Communications Driver Toolkit API Application Developer Guide*
GFK-0262	*Series 90™-70 Programmable Controller Installation Manual*
GFK-0263	*Logicmaster 90™-70 Programming Software User's Manual*
GFK-0265	*Series 90™-70 Programmable Controller Reference Manual*
GFK-0356	*Series 90™-30 Programmable Controller Installation Manual*
GFK-0466	*Logicmaster 90™-30/20/Micro Programming Software User's Manual*
GFK-0467	*Series 90™-30/20/Micro Programmable Controllers Reference Manual*
GFK-1004	*TCP/IP Ethernet Communications for the Series 90™-70 PLC*
GFK-1260	*CIMPLICITY® Server for Windows NT Trending Option Operation Manual*
GFK-1396	*CIMPLICITY HMI for Windows NT and Windows 95 CimEdit Operation Manual*

At GE Fanuc Automation, we strive to produce quality technical documentation. After you have used this manual, please take a few moments to complete and return the Reader's Comment Card located on the next page.

Libby Allen
Senior Technical Writer

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Chapter 1 Introduction

Welcome to GE Fanuc's CIMPLICITY Display Station products. The package you receive contains an integrated hardware and software platform for running CIMPLICITY HMI applications, plus all the documentation you need to customize and maintain your CIMPLICITY Display Station system. This revision of the Display Station incorporates CIMPLICITY HMI software for Windows and either Microsoft Windows 95 **or** Microsoft Windows NT software (depending on model).

This chapter provides an introduction to your CIMPLICITY Display Station system, plus an overview of the CIMPLICITY HMI software and its relationship to the entire family of CIMPLICITY Monitoring and Control products. The following topics are presented:

- What You Receive 1-2
- CIMPLICITY Display Station Products 1-2
- System Architecture 1-7
- Hardware Description 1-9
- Customer Support 1-12

What You Receive

Note

Please refer to the Data Sheet and Important Product Information (IPI) documents provided with your CIMPLICITY Display Station system for specifics pertaining to the hardware and software delivered with your particular system. The information in the Data Sheet and IPI supersedes information in this manual.

When you purchase a CIMPLICITY Display Station system, you receive:

- CIMPLICITY Display Station industrial computer with CIMPLICITY HMI and Operating System software installed.
- Power cord
- Installation hardware package (includes washers, springs, and nuts)
- CIMPLICITY Display Station Data Sheet and IPI documents, which describe specifics of the hardware and software for your particular system
- CIMPLICITY Display Station system documentation
- CIMPLICITY software licenses and license agreements
- Microsoft Windows documentation, software distribution, Certificate of Authenticity and license agreement
- CIMPLICITY software (distributed on floppy disks)
- Utilities disk

If you believe that items are missing from your shipment, contact your distributor.

CIMPLICITY Display Station Products

System Configurations

The CIMPLICITY Display Station products consist of an industrial operator interface coupled with CIMPLICITY HMI software. The Display Station product family incorporates CIMPLICITY MES/SCADA and HMI for Windows and either Microsoft Windows 95 **or** Microsoft Windows NT. Display Station products are offered in the configurations listed in Table 1-1.

Table 1-1. CIMPLICITY Display Station Product Listing

Touch Display		
IC751ATS200	**Windows 95**	**Windows NT**
HMI Multiple Device Runtime System	IC646MRT000	–
Trending	IC646MTR000	–
Series 90™ Protocol (SNP)	(included in base)	–
Series 90™ Ethernet (TCP/IP)	(included in base)	–
IC751ATS350	**Windows 95**	**Windows NT**
HMI Development & Runtime System	–	IC646TMN010
Trending	–	IC646TTR000
Series 90™ Protocol (SNP)	–	(included in base)
Series 90™ Ethernet (TCP/IP)	–	(included in base)

Touch Station		
IC751BTS200	**Windows 95**	**Windows NT**
HMI Multiple Device Runtime System	IC646MRT100	–
Trending	IC646MTR000	–
Series 90™ Protocol (SNP)	(included in base)	–
Series 90™ Ethernet (TCP/IP)	(included in base)	–
IC751BTS300	**Windows 95**	**Windows NT**
HMI Development & Runtime System	IC646MRT100	–
Trending	IC646MTR000	–
Series 90™ Protocol (SNP)	(included in base)	–
Series 90™ Ethernet (TCP/IP)	(included in base)	–
IC751BTS350	**Windows 95**	**Windows NT**
HMI Development & Runtime System	–	IC646TMN010
Trending	–	IC646TTR000
Series 90™ Protocol (SNP)	–	(included in base)
Series 90™ Ethernet (TCP/IP)	–	(included in base)

Table 1-1. - Continued

Glide Station		
IC751BGP200	**Windows 95**	**Windows NT**
HMI Multiple Device Runtime System	IC646MRT000	–
Trending	IC646MTR000	–
Series 90™ Protocol (SNP)	(included in base)	–
Series 90™ Ethernet (TCP/IP)	(included in base)	–
IC751BGP300	**Windows 95**	**Windows NT**
HMI Development & Runtime System	IC646MRT100	–
Trending	IC646MTR000	–
Series 90™ Protocol (SNP)	(included in base)	–
Series 90™ Ethernet (TCP/IP)	(included in base)	–

Accessories

Table 1-2. Accessory Products

CIMPLICITY parallel application transfer cable	IC751BCL200
CIMPLICITY SNP cable (RS-422)	IC751BCL300
CIMPLICITY HMI Ethernet transceiver (thinwire) 15-pin AUI to thinwire (10Base2) transceiver 3-foot AUI extension cable	IC751BET000

Software Licenses

CIMPLICITY System software for this system is licensed in one of configurations listed in Table 1-3.

Table 1-3. Software Configurations

License	Features
Runtime - Multiple Devices (Windows 95)	Full CIMPLICITY Base System runtime features plus Communications to unlimited GE Fanuc PLCs via SNP or TCP/IP protocols (16 MB memory)
Development & Runtime (Windows NT)	Full CIMPLICITY Base System runtime and project development features plus Communications to unlimited GE Fanuc PLCs via SNP or TCP/IP protocols (32 MB memory)

If you purchase additional product options (see "Options and Upgrades") to run on the Display Station, it is necessary to contact GE Fanuc to update the system licensing. Use one of these two numbers to reach GE Fanuc to update your registration:

Phone: 518-464-4619 Fax: 518-464-4581

Faxes and phone calls will be processed between 8 AM and 5 PM Eastern time, Monday through Friday, except for regularly scheduled holidays. Faxes and calls received after hours, on weekends, or holidays will be processed as soon as possible on the following business day.

When you phone, please be prepared to provide GE Fanuc with the following information:

- Your User information
- CIMPLICITY serial numbers
- The System Key Code generated during the registration procedure

Options and Upgrades

The following CIMPLICITY Software Options can be purchased for use with CIMPLICITY Display Station products:

Table 1-4. Software Options and Upgrades

Application Options	Windows 95	Windows NT
Alarm Management API	IC646MAA000	IC646TAA000
BASIC Control Engine	IC646MCS000	IC646TCS000
Database Logger	—	IC646TDL000
Device Communications Driver Toolkit API	IC646MDC000	IC646TDC000
Point Management API	IC646MPM000	IC646TPM000
Communications Options	**Windows 95**	**Windows NT**
Series 90™ Ethernet (TCP/IP) — option for IC751ATS100, IC751BTS100, IC751BGP100	IC751BUU500	–
MODBUS™ RTU	IC646MMR000	IC646TMR000

You can easily upgrade your system to 24 or 32MB. (Installation instructions for memory upgrades are provided in Chapter 5.)

For more information about purchasing GE Fanuc products, please call your distributor. You can call the GE Fanuc Information Centers at one of the following numbers for the location of your nearest GE Fanuc sales representative authorized distributor:

USA and Canada	1-800-648-2001
Europe	352-727979-1
Asia Pacific	65-566-4919

System Architecture

CIMPLICITY Monitoring and Control software is designed for scalability — you can expand your system from a single Display Station to an enterprise-wide supervisory control and data acquisition system. The CIMPLICITY HMI software is one of four components within CIMPLICITY Monitoring and Control software.

• CIMPLICITY HMI	Provides local data collection and monitoring. Easily integrates with MES/SCADA systems.
• CIMPLICITY MES/SCADA (Manufacturing Execution Systems/Supervisory Control and Data Acquisition)	Provides client/server architecture for enterprise-wide supervisory monitoring.
• CIMPLICITY Control	Programming, configuration, diagnostic and development software for PLC, CNC, and PC controllers.
• CIMPLICITY Motion	Motion profiler, configuration, and diagnostic software for general purpose motion controllers.

The networking capabilities that are provided throughout the CIMPLICITY Monitoring and Control product line are designed to allow well-defined levels of integration (Figure 1-1). This architecture allows a Server to seamlessly collect or distribute data to Display Station products and to support Viewers. And, a Display Station can seamlessly network to other HMI systems. These capabilities allow you to eliminate redundancies within your network. For example:

Each HMI system can display screens from any other HMI system on the network with no additional configuration.

Points are configured only once on an HMI or Server.

Screens can be developed and stored in a single location on the network and accessed by any other CIMPLICITY HMI, Server, or Viewer on the network.

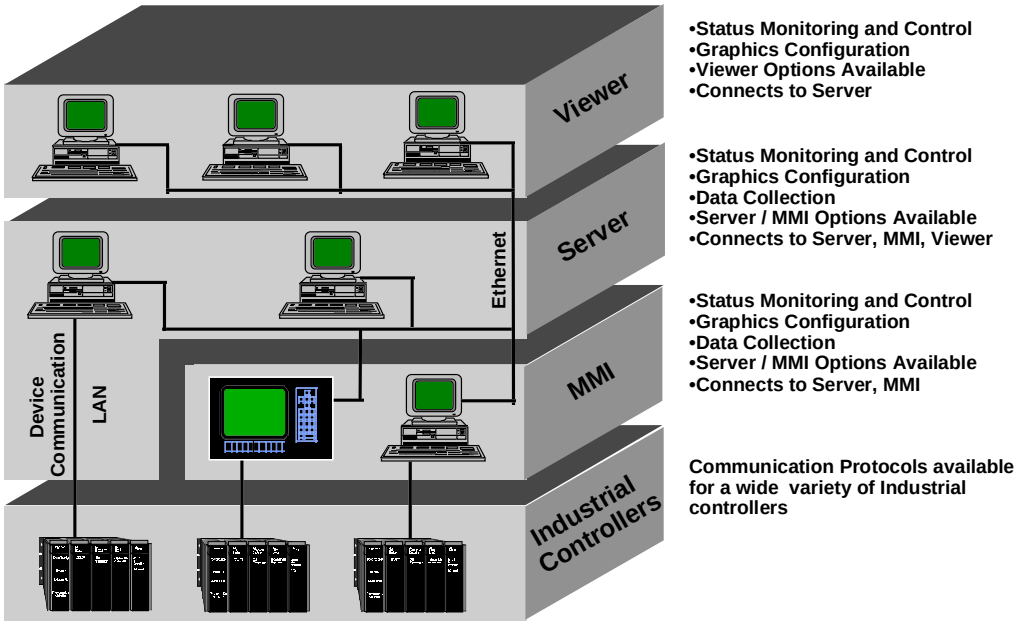


Figure 1-1. Integration Levels in CIMPLICITY Monitoring and Control Software

Three levels of licensing are available to support the levels of integration:

HMI	Provides local data collection and control capabilities while permitting you to view the entire facility through the Server. The HMI supports networking among multiple HMIs, data processing options such as ODBC database logging, and Server viewing capabilities.
Server	Provides data collection, data processing and data storage capabilities for a multi-user environment. The Server can be connected to networks of Viewers and HMIs to provide an overall picture of an entire production process.
Viewer	Provides the graphic user interface to the CIMPLICITY Server. In a client/server architecture, the graphics applications run native on the Viewer system, significantly reducing the load on the server, and distributing the processing power over several computers.

Hardware Description

The primary characteristics of the CIMPLICITY Display Station products are:

High Performance The CIMPLICITY Display Station products are high-performance, IBM-compatible PCs that are designed to work with CIMPLICITY software. The system architecture is based on the 80486DX2-66 microprocessor. Each CIMPLICITY Display Station system contains the following components:

- 486DX2-66 CPU
- 500MB or larger hard disk with CIMPLICITY and Microsoft Windows operating system software installed
- 3.5" floppy disk drive
- 10.4" High brightness, dual scan, color flat panel display
- Touch screen or Touch Pad mouse
- One RS-232 port
- One RS-422/RS-232 port
- Parallel printer port
- Ethernet port (10baseT and AUI connectors)
- PS/2® External Keyboard port
- Removable plate that can be modified to allow access to user-added Industry Standard Architecture (ISA)-compatible board (3/4 length, maximum) — *Glide Station and Touch Station units only*).

Rack Mounting CIMPLICITY Display Stations are packaged in a single-unit, steel enclosure that has a flange for secure fit in a rack. The Touch Display unit weighs approximately 14 pounds (6.4kg). The Touch Station and Glide Station Units weigh approximately 18.5 pounds (8.4kg).

Ease of Operation Each CIMPLICITY Display Station comes ready to run, with CIMPLICITY software and the operating system software installed on the hard disk.

® PS/2 is a registered trademark of IBM Corporation.

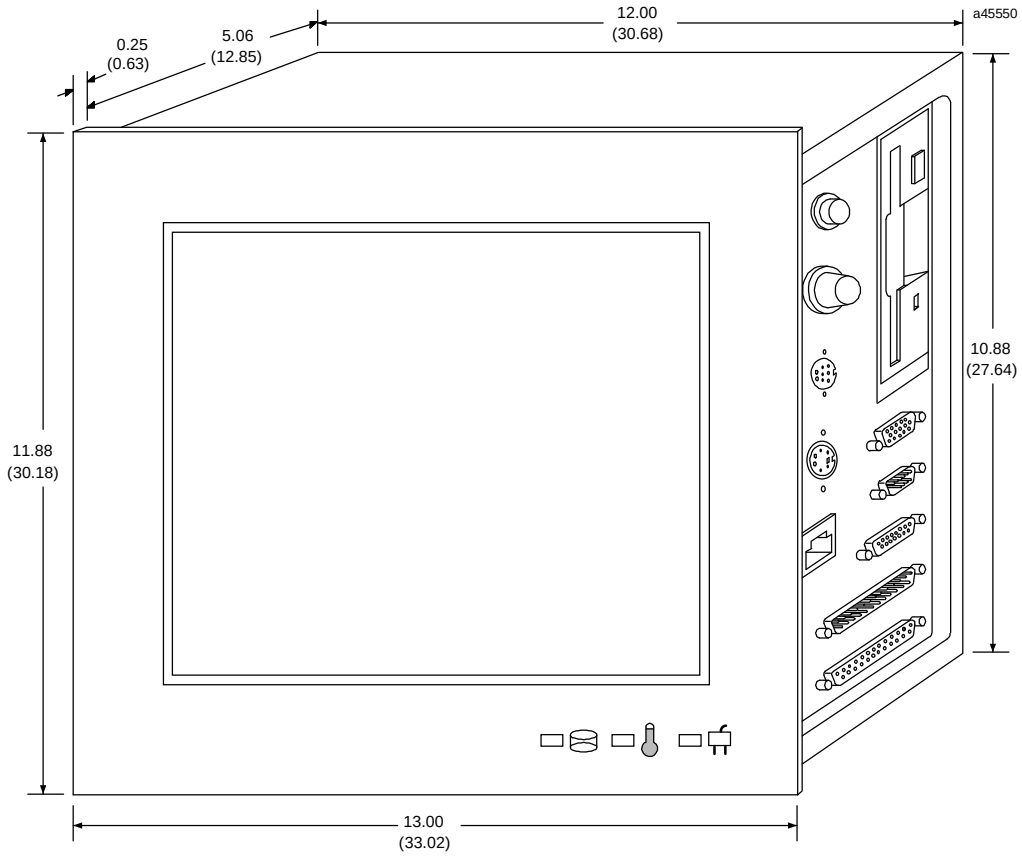


Figure 1-2. CIMPLICITY Touch Display System

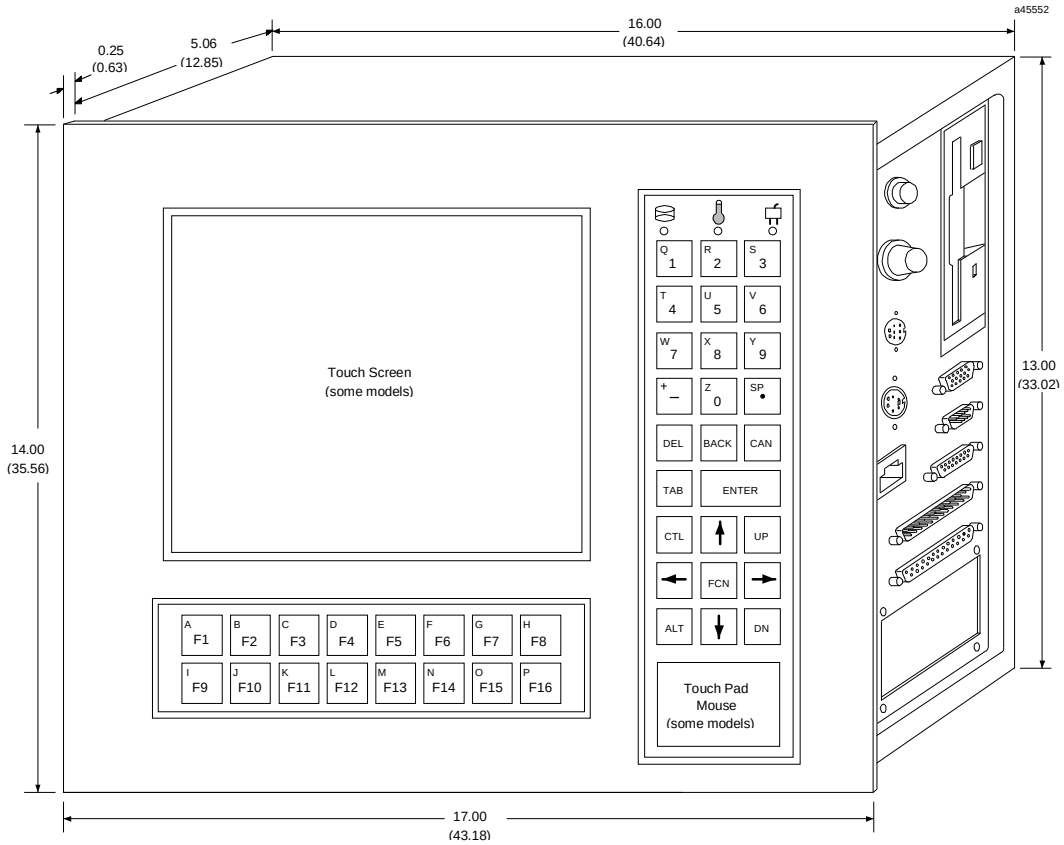


Figure 1-3. CIMPLICITY Touch Station and Glide Station Systems

Customer Support

GE Fanuc takes pride in the high quality of the CIMPLICITY software. Great emphasis has been placed on ensuring the quality of this system throughout development and testing. In spite of this, from time to time you may encounter problems or deficiencies in the software or documentation.

If your CIMPLICITY software system is under warranty or is covered by a valid support contract, you may report problems to the CIMPLICITY Technical Support Hotline at one of the following numbers:

USA and Canada	1-800-GEFANUC (1-800-433-2682)
All others	804-978-6036
Fax	804-978-5099
Internet address	CIMHOTLINE@CHO.GE.COM

The CIMPLICITY Hotline is available from 8 A.M. to 8 P.M. Eastern time, Monday through Friday, except for regularly scheduled holidays.

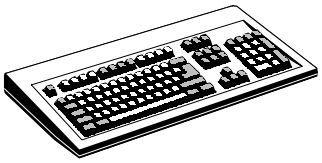
Chapter 2 Getting Started

This chapter provides the basic information that you need to set up your Display Station product and begin using it. You may need to refer to other chapters in this manual for information pertaining to specific requirements of your system.

- Unpacking the Display Station Products 2-2
- Hardware Installation 2-3
- Powering Up the Display Station 2-10
- Shutting Down the Display Station 2-16
- How to Use the Touch Screen (Touch Station and Touch Display Products).....2-17
- How to Use the Touch Pad Mouse (Glide Station Products) 2-20
- How to Operate the Keypads (Touch Station and Glide Station Products) 2-25
- Moving the Display Station 2-27
- Summary.....2-27

Note

A standard PS/2-type keyboard is *required* for first-time power up. If you have a Windows 95 system, you will be required to enter the Product ID on the Windows 95 Certificate of Authenticity, and other data, to set up your system. If you have a Windows NT system, you will simply need to log on.



Unpacking the Display Station Products

Caution

Electrostatic discharge **(ESD) is a major cause of electronic component failure. Extreme care should be taken to avoid damaging the Display Station with static electricity. A small, imperceptible electrostatic discharge could occur without your knowing and could be enough to damage electronic components.**

To avoid damage from electrostatic discharge, adhere to the following precautions.

- Wear a properly functioning antistatic strap and be sure that you are fully grounded before touching the connectors on the Display Station.
- Extra caution should be taken in cold dry weather, when static charges can easily build up.

1. Unpack the Display Station. Make sure that you have the following items: Display Station system hardware, power cord, CIMPLICITY software distribution, Microsoft Windows software distribution, user's manuals, and datasheet.
2. File that datasheet in a safe place.
3. Inspect for damage.
4. Read the software license agreement(s) on the document package(s). If unacceptable, do not proceed; Return the system.
5. Record the computer serial number in the space provided in the "Preface" of this manual. The serial number is located on the back of the unit enclosure.
6. Review the hardware description.
7. Perform the procedure described in "Hardware Installation."

Hardware Installation

You may want to complete the "First-Time Powerup" procedure, described on page 2-11, before you install the Display Station in an equipment panel. (This procedure includes software license registration.)

Mounting the Display Station Unit

Mounting Location

When selecting a location for the Display Station, make sure that there will be enough space for access to the floppy disk drive and connectors located on the right side panel of the unit. Allow approximately 6 inches (15.2 cm). For overall unit dimensions, refer to Figures 1-2 and 1-3.

Allow 2 inches (5.1 cm) depth for the power cord that is provided with the Display Station. If you don't have this amount of space, a lower profile power cord that requires less space can be purchased.

The mounting location for the Display Station should meet the following requirements:

Caution

For Touch Display and Touch Station products: The protective film covering on the touch screen is *not* suitable for use in conditions of prolonged exposure to direct sunlight. (Exposure to sunlight through window glass will not harm the protective film.)

Caution

Temperature in the Display Station operating environment should not exceed 45°C/113°F. Exposing the Display Station to ambient temperatures greater than this limit could damage the hardware or cause data to be lost.

You should monitor the temperature in the operating environment to ensure that it does not exceed 45°C/113°F. The overtemperature indicator on the Display Station is provided only as a secondary precaution. The Display Station does *not* automatically shut down when the overtemperature indicator is lighted.

Temperature rise should not exceed 20°C (68°F) per hour. Exposing the Display Station to thermal shock could damage the disk drives. Note that the operating temperature range of the Display Station is 0 to 45°C (32.0 to 113°F).

The operating temperature range of floppy disks is 5 to 40°C (41 to 104.0°F). Operating the floppy disk drive when the ambient temperature is outside this range could damage the disk medium as well as cause permanent damage to the floppy drive heads.

Equipment Panel Cutout

The Display Station unit is designed to be installed in a cutout in an equipment panel. Dimensions for the mounting hole cutout and the locations of screw holes for the Touch Display are provided in Figure 2-1. The Touch Station and Glide Station require the mounting hole cutout and screw holes shown in Figure 2-2.

Caution

When installing the Display Station, do not over-tighten the nuts on the mounting studs. This could damage the studs or the front panel of the Display Station.

The Display Station has mounting studs for securing the unit to the equipment panel. To install the unit, you will need the following hardware, which is provided with the Display Station:

	Quantity	
Item	**Touch Display**	**Touch Station/ Glide Station**
Washer	14	18
Springs	14	18
Nut	14	18

Mounting stud specifications: #6 (32 threads/inch)
0.138 inch OD

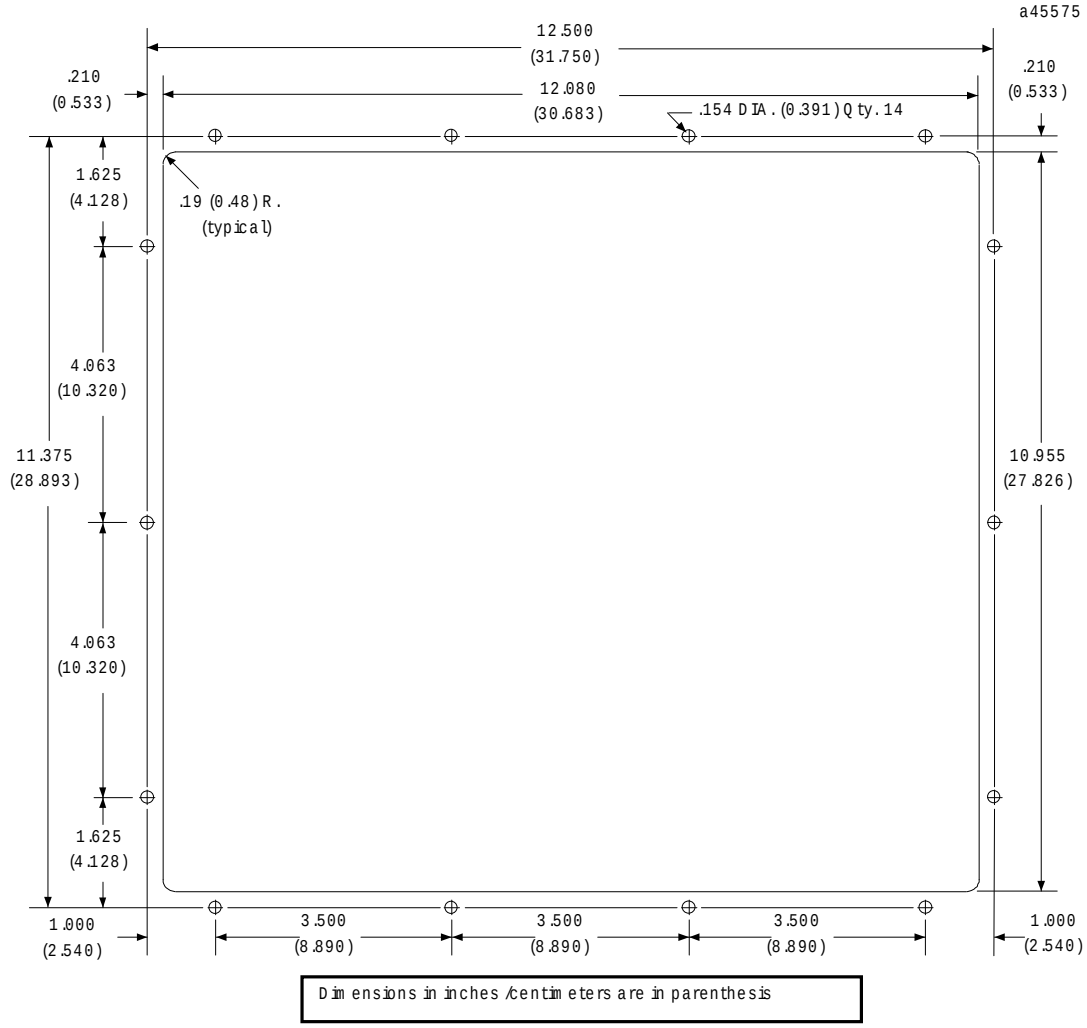


Figure 2-1. Mounting Hole Dimensions, Touch Display Unit

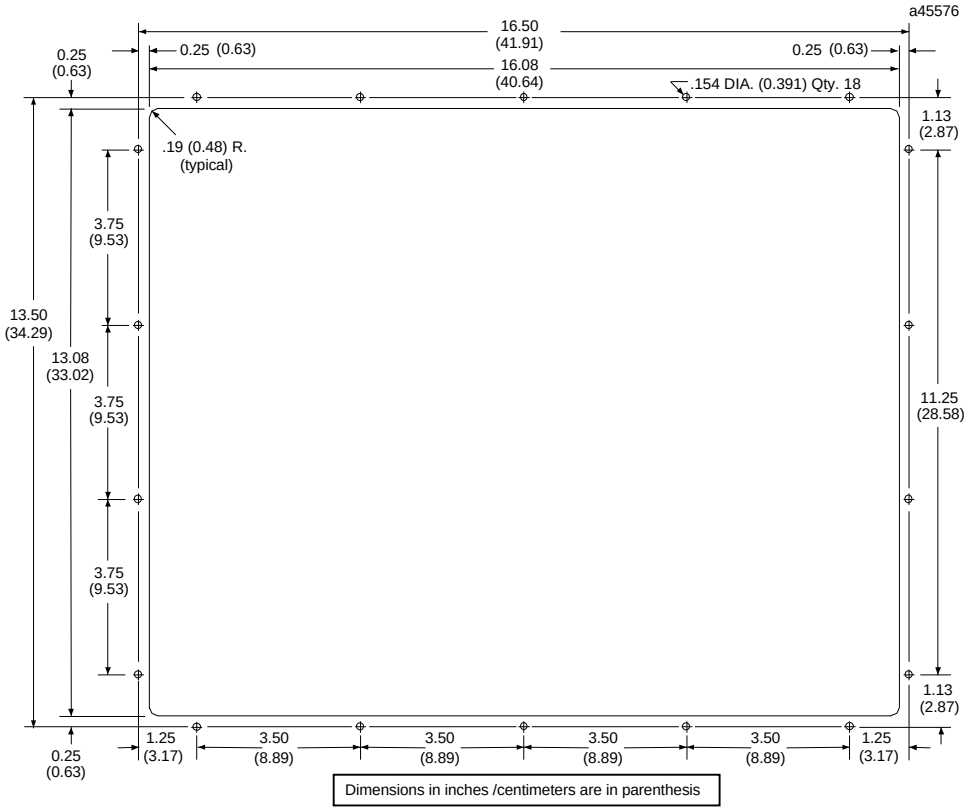


Figure 2-2. Mounting Hole Dimensions, Touch Station and Glide Station Units

Display Station Connections

Display Station connectors and their functions are described in this section. As shown in Figure 2-3, all connectors are located on the side panel of the unit except for AC power, which is located on the rear panel. Table 2-1 lists the connectors and Figure 2-4 provides a connection diagram. Details of port and cabling configurations are provided in Appendix A.

Warning

Each Display Station product is equipped with a three-wire power cord and plug for your safety. Use this power cord with a properly grounded electrical outlet to avoid electrical shock. The Display Station and all associated devices should be connected to a common ground.

Caution

The Display Station is shipped with ESD-protective caps on its ports. Do not remove the ESD cap from a port if you do not plan to use the port.

Store the removed ESD caps with the original packing material for use if you need to store or ship the Display Station.

Note

To comply with FCC regulations and CE mark requirements, shielded cables must be used for all connections to the Display Station.

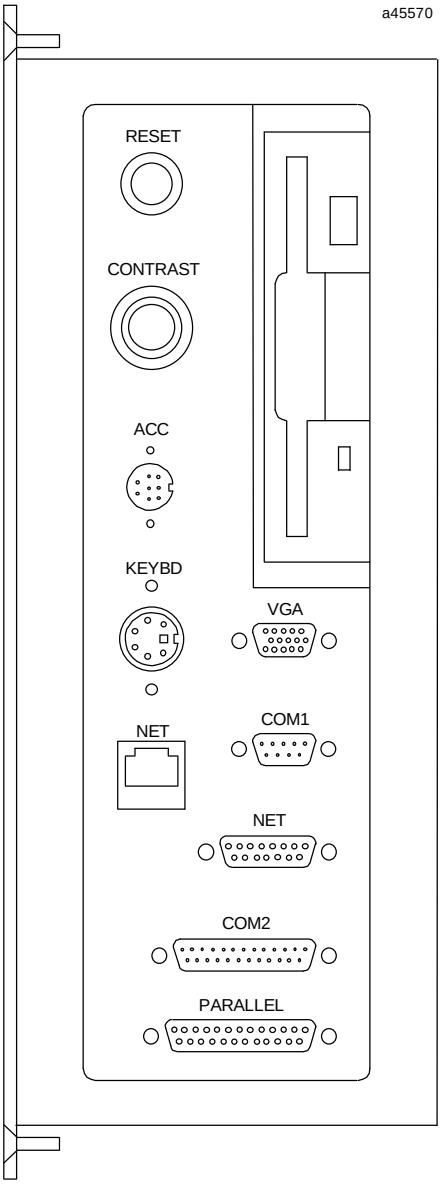


Figure 2-3. Display Station Side View

Table 2-1. Display Station Connectors

Location	Label	Type	Function
Side	ACC	female 8-pin DIN	External RESET, external speaker, and watchdog timer.
	KEYBD	female 6-pin mini DIN	External keyboard connection.
	NET*	RJ-45 (10baseT)	MAU MDI Ethernet connection.
	VGA	female 15-pin high density D-type	Connection for external VGA monitor. See “External Display” in Chapter 6 for details.
	COM1	male 9-pin D-type	Windows 95 systems: Serial (RS-232) port. Connection for serial mouse. (COM1 is set up to be compatible with a Logitech™ serial mouse.) Windows NT systems: COM1 is dedicated to touch screen operation.
	NET*	female 15-pin D-type	AUI Ethernet connection.
	COM2	male 25-pin D-type	Serial (RS-422/232) port. Connection for SNP communications.
	PARALLEL	female 25-pin D-type	Connection to CIMPLICITY Windows 95 Development systems via Windows 95 Direct Cable Connection, CD ROM drive, or printer. (Windows NT systems do not support Direct Cable Connection.)
Rear	—	male 3-prong	AC in.

* Only one network (NET) connector can be used at a time.

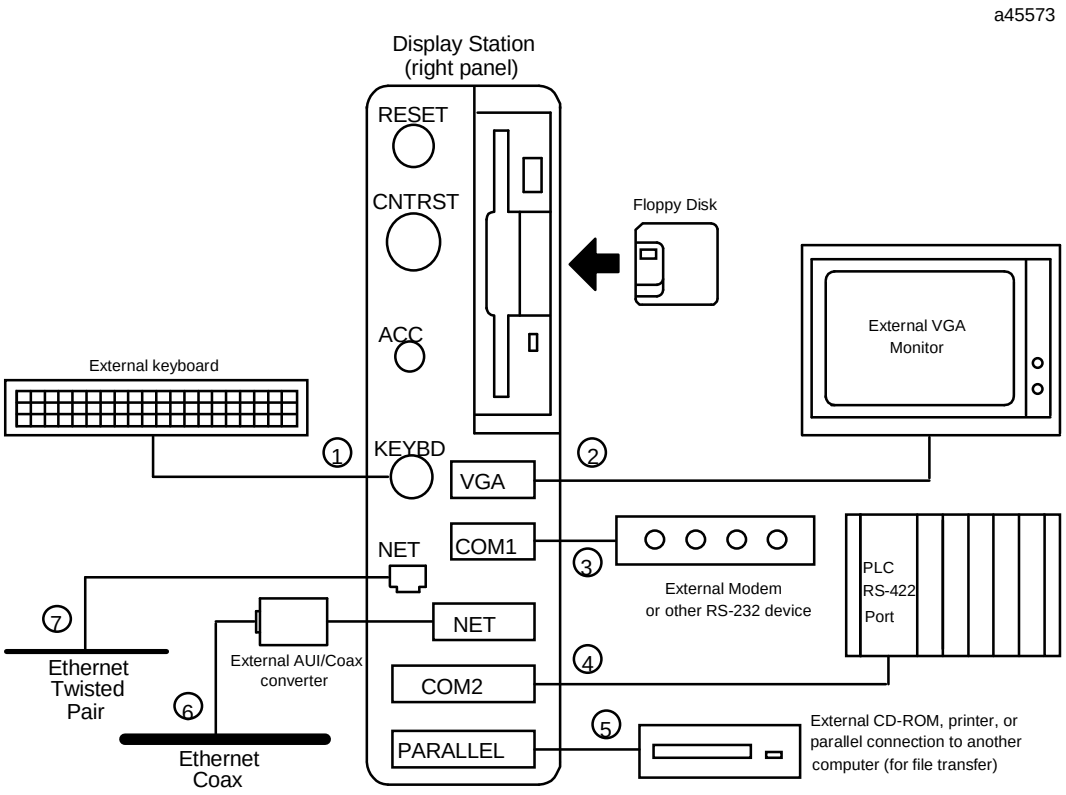


Figure 2-4. Connection Diagram

Notes

1. Standard keyboard and cable. Key Tronic® keyboards are recommended.
2. External VGA monitor. See Chapter 6 for details.
3. The COM 1 connector is a standard 9-pin RS-232 configuration. See Appendix A for details.
4. The 25-pin COM 2 port connector does not use a standard pinout configuration. You must review the pinout to make sure that the device that you want to use will function properly. See Appendix A for details.
5. Standard 25-pin, D-type female connector. See Appendix A for details.
6. AUI Ethernet connection. See Appendix A for details.
7. 10BaseT (MAU MDI) Ethernet connection. See Appendix A for details.

Powering Up the Display Station

Controls and Indicators

Operation of the controls and indicators, listed in Tables 2-2 and 2-3, is for all Display Station models. For the locations of controls and indicators, see Figure 2-3 on page 2-7.

Table 2-2. Control Functions

Designation	Function
RESET	Resets the CPU
CONTRAST	Adjusts the display contrast.
none	Ejects a floppy disk

Caution

Temperature in the Display Station operating environment should not exceed 45°C/113°F. Exposing the Display Station to ambient temperatures greater than this limit could damage the hardware or cause data to be lost.

You should monitor the temperature in the operating environment to ensure that it does not exceed 45°C/113°F. The overtemperature indicator on the Display Station is provided only as a secondary precaution. The Display Station does *not* automatically shut down when the overtemperature indicator is lighted.

Caution

Temperature rise should not exceed 20°C (68°F) per hour. Exposing the Display Station to thermal shock could damage the disk drives. Note that the operating temperature range of the Display Station is 0 to 45°C (32.0 to 113°F).

Note

The overtemperature indicator on the Glide Station and Touch Station units will light if the internal temperature is between 48 and 52°C (118—126°F) and will not go off until the temperature drops below approximately 45°C (113°F). This feature is not implemented on the Touch Station units.

Note

For best performance, *high temperature, long life* floppy disks should be used. Lower quality floppy disks could fail during repeated read/write cycles.

Table 2-3. Indicator Functions

Designation	Function
	Hard disk drive access indicator light. Lights when the hard disk is in use.
	Overtemperature indicator light. When lighted, the temperature inside the unit has exceeded manufacturer's requirements. Shut down the Display Station and correct the temperature problem in the operating environment (or move the unit to a cooler location) before continuing to operate
	Power on indicator light. Lights when system power is ON.

First-Time Powerup

Note

The unit's nonoperating and shipping temperature range (-20 to 60°C) exceeds the operating temperature (0 to 45°C) range. If the product is at a temperature above or below the operating range, you should allow the unit to stabilize at the operating temperature for eight hours before applying power to the Display Station system.

Note

A standard PS/2-style keyboard is *required* for first-time power up. When you power up the system, you will need to enter the product ID on the Windows 95 Certificate of Authenticity. To do so, you will need to use the keyboard.

If you have a Touch Station or Glide Station computer, it is possible to register the license using the industrial keypad. If you have a Windows NT system, you will not be required to enter Certificate of Authenticity information, but you will need a keyboard to log on.

Note

It is recommended that you log onto the system as **Administrator**. Doing so eliminates the requirement to log onto CIMPLICITY when you run the CIMPLICITY Demo. All CIMPLICITY projects are configured with an Administrator user by default.

1. Connect an external keyboard to the KEYBD connector.
2. Connect the computer to AC power — it will power up automatically. The computer performs self-test diagnostics each time it is powered up. The self-test is a series of checks that verify correct performance of the computer hardware. When the self-test is being performed, you will see the message XXXX KB OK displayed on the screen, where XXXX is a number that increases until it matches the amount of usable memory.

3. Following the system self test, Windows software will be booted and the Windows 95 screen or Windows NT screen will be displayed.

Note

After permanent installation, you should wait until the unit has been powered up for an hour and then make your final adjustment of the display contrast. (To adjust, turn the CONTRAST knob on the right side of the unit.)

If the unit will be used in an environment where the ambient temperature is likely to vary, adjust for best viewing when the unit has stabilized at the middle of the temperature range. For example, if you expect the ambient temperature to vary from 0 to 45°C, let the unit stabilize at 23°C, then make the adjustment. This provides acceptable viewing at 0 to 45°C. If you expect the temperature to vary from 25 to 45°C, adjust the contrast at 35°C.

The description of the first-time powerup sequence for Windows 95 systems starts on page 2-13. For the Windows NT sequence, go to page 2-16.

Windows 95 Systems

1. When the Welcome to Windows 95 screen is displayed, press the **RETURN** key to continue. The Windows 95 Setup screen will appear.

Windows 95 Setup
Welcome to Windows Setup
Click the Next button to continue or the Cancel button to quit Setup.
The three parts of Setup are:
1) Gathering information
2) Configuring your computer
3) Restarting your computer
< Back
Next >
Cancel

2. You will be asked to enter the Region Settings and select the type of keyboard you will be using with the system. Press **ENTER** to select the defaults.
3. You must then enter your Name and Company. Use the **TAB** key to move between fields. (The field that is active will be highlighted.) To return to the previous field press **SHIFT** + **TAB**. Press **ENTER** to continue to the next screen.
4. Review the Windows 95 End User License Agreement and press **ENTER** to continue.
5. Press the **TAB** key to indicate that you Accept the agreement and press **ENTER** to continue.

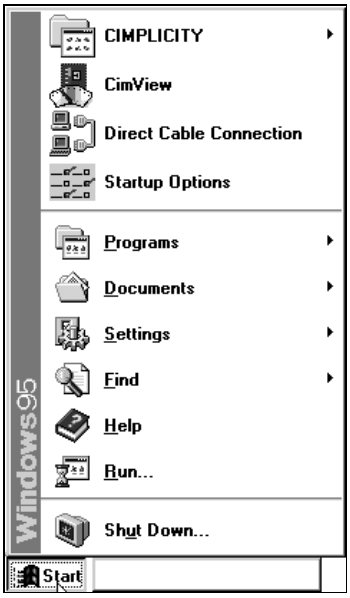
6. Type the product ID on the Certificate of Authenticity (the number next to the Product ID in the Windows 95 distribution pack) and press **ENTER** to continue.
7. The system automatically installs devices and network parameters. When the setup is complete, the system will prompt you to restart the system. Press **ENTER** to restart the system.
8. The system reboots, completes the self-test sequence, and displays the Windows Login dialog box. Type a user name and, if desired, a password. It is recommended that you log on as Administrator (**admin**, no password).
9. The Add Printer Wizard is displayed. If you know the type of printer you will be using, press **ENTER** now to add a printer. Otherwise press **ESC**; you will be able to configure a printer later.
10. Select your Time Zone. Use the left and right arrow keys to select your time zone and press **ENTER**.
11. The Welcome to Windows 95 dialog box is displayed.

Welcome
Welcome to Windows 95
Did you know...
To see how much disk space is free, use your right mouse button to click the icon for the drive in My Computer; then click Properties.
Windows Tour
What's New
Online Registration
Next Tip
Show this Welcome Screen next time you start Windows
Close

12. Press **ALT-S** to prevent this dialog box from being displayed in the future. Press **ENTER** to close the display.

13. The Windows 95 first-time powerup process is complete.

To access programs, documents, computer settings and utilities, click the Start button on the Windows 95 toolbar. The Start menu will appear. The icons for CIMPLICITY and related software are listed above the dividing line. The icons below the dividing line are provided with Windows 95.



To access the features of CIMPLICITY software, click the CIMPLICITY icon. The following menu will appear. For information about running CIMPLICITY software, refer to Chapter 4.

Windows NT Systems

When you power up the Display Station, the following message will appear:

```
Microsoft ® Windows NT (™) version x.xx (Build xxxx)
1 System Processor [xxxxx Kb memory]
```

This message will be followed by the Microsoft Windows NT screen, and the following dialog box:

```
Welcome
Press Ctl-Alt-Del to log on.
```

Press **CTL-ALT-DEL**. A dialog box requesting the following information will be displayed:

USERNAME Enter a valid user name (See your system administrator) or log on as administrator (**admin**).

FROM: If you are connected to a network, select the domain where your account is established. (See your system administrator.) Otherwise, log onto the default domain.

PASSWORD: Enter your password. The first time you log on you will be prompted to verify your password.

How to Use the Touch Screen

Operation

To use the touch screen, lightly tap on the surface or lightly glide your finger across the surface. The mouse pointer should follow your finger. To execute a click, gently and quickly tap the surface of the touch screen. Tap with a light touch and lift your finger sharply. A single tap executes a single click, and two rapid taps execute a double click. (Or, lightly rest your finger on the screen, then quickly apply pressure twice.) To drag, or highlight an area, lightly tap and then glide your finger across the surface.

Hint: If you need to adjust the cursor position, you may find it helpful to roll your fingertip slightly when pressing it on the screen.

The touch screen is covered by a protective film that prevents damage from dust, moisture and solvents. Refer to Appendix F for specifications for the protective film.

Note

The touch screen does not operate while the Windows task list is displayed. This window is only accessed by pressing **CTRL-ALT-DEL** (Windows 95 systems) or **CTRL-ESC** (Windows NT systems) on the keyboard. You can cancel this window using the keyboard. See Chapter 6 for details of external keyboard operation.

Touch Screen Settings

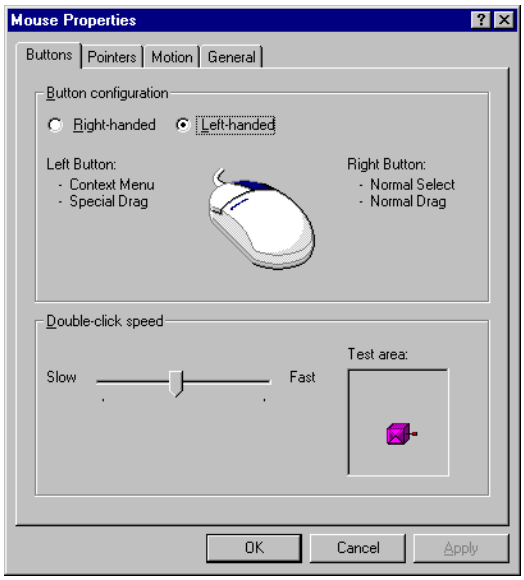
Your Display Station comes with the touch screen configured and ready to use. The procedures in this section are required only if you want to change the touch screen settings to suit your preferences.

Note

Operating temperature may affect touch screen calibration. Refer to Chapter 10 for calibration instructions.

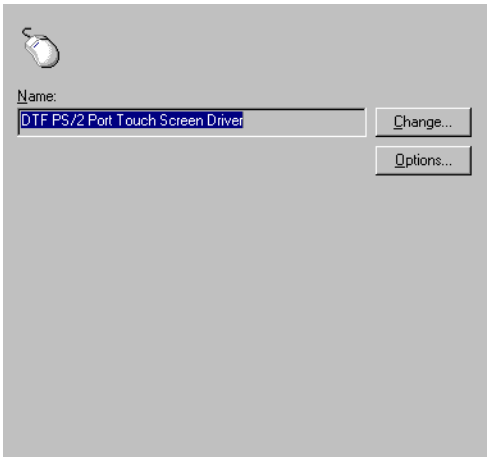
Windows 95 Systems

To activate, and then adjust and test the touch screen settings, open the Windows Control Panel and double-click the Mouse icon. The following Mouse Properties window will appear.

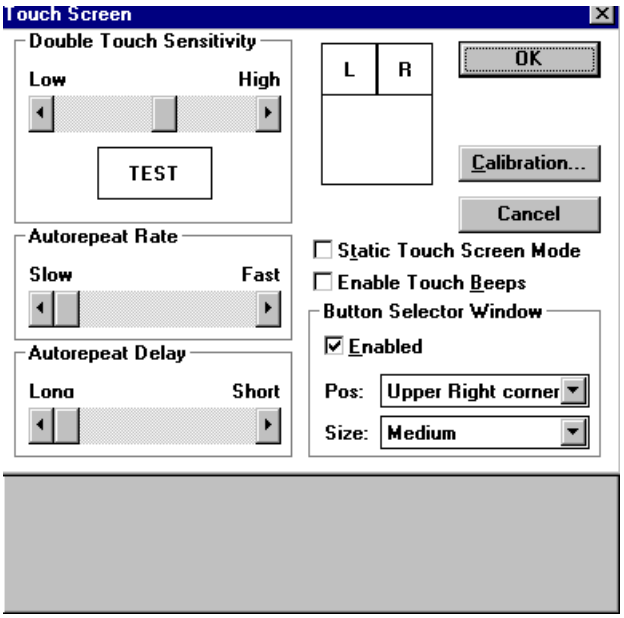


To adjust the touch screen settings, select the General tab.

From the General Tab, select Options. This displays the dialog used for adjusting the touch screen. This screen allows you to adjust the double click rate for the touch screen or calibrate the touch screen. You can also enable the Button Selector window which lets you change the touch screen taps from *left* mouse button clicks to *right* mouse button clicks, and back again. (This feature is useful for Windows-related tasks that require the right button functions. It is not needed to operate CIMPLICITY HMI software.)



To enable the Button Selector window, click the Options button on the General tab. The Touch Screen dialog box will appear. Click the Enabled box under Button Selector Window. To select the Button Selector position and size, scroll the selector windows that are located immediately below the Enabled box.



The Button Selector will immediately appear in the location that you specify. Click OK to return to the Mouse Properties window.

Windows NT Systems

Touch screen settings are set from the Touchscreen Control application in the Touch (Common) program group. This application provides the ability to calibrate the touch screen and set parameters such as the double click rate. Online Help information is available in this application.

It is recommended that you use the touch screen settings and not the Mouse setting in the Control Panel to change the system settings because the touch screen uses the same set of system parameters.

How to Use the Touch Pad Mouse

About the Touch Pad Mouse

The Touch Pad mouse, located at the bottom of the right-hand keypad on the Glide Station unit, detects the position of a finger over a touch-sensitive area. Like a mouse, this device controls the movements of the cursor on the screen. The Touch Pad mouse is a capacitive sensor. Your finger is detected by measuring its effect on an array of capacitive lines integrated into the PC board. The Touch Pad mouse senses both the finger's position and its contact area. The area of contact is a measure of applied pressure. On the Display Station units, pressure on the Touch Pad mouse controls the speed of cursor movement.

The Touch Pad mouse provides a durable surface with no moving parts to collect dirt or wear out. It is sealed to the Glide Station front panel and protected by a mylar film that prevents damage from dust, moisture, and solvents. For specifications and cleaning instructions for the protective film, refer to Appendix F.

Operation

To use the Touch Pad mouse, lightly glide your finger across the surface. No pressure is required The Touch Pad mouse responds best to a light touch. Roll your fingertip slightly for fine positioning. To execute a click, gently and quickly tap the surface of the pad. Tap with a light touch and lift your finger sharply. As shown in Figure 2-5, a single tap executes a single click and two rapid taps execute a double click. To drag, or highlight an area, double tap on the surface, holding your finger down on the second tap. You can drag anywhere along the surface.

The Touch Pad mouse has a special "edge-motion" feature that allows you to extend a drag operation when your finger reaches the edge of the sensor pad. When you hold the finger against the edge, the cursor continues to move in the indicated direction.

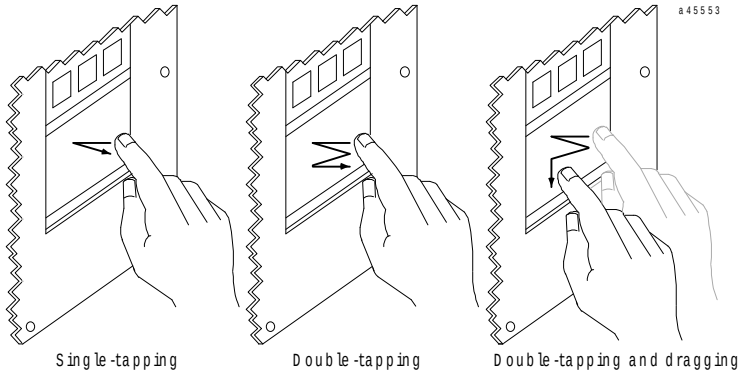


Figure 2-5. Using the Touch Pad Mouse

Touch Pad Mouse Special Features

The Touch Pad mouse has many advanced features, which are described in this section. These features are included on the Touch Pad mouse table of the Mouse icon in the Control Panel.

- Scrolling feature (Virtual Scroll Bar)
- Cursor-control feature (Edge Finder)
- Pressure-meter icon in Windows 95 Taskbar – has right-click popup menu
- Tutorial and integrated help for enhanced features

TouchMeter Icon

When the Touch Pad mouse Enhancement software is enabled, the TouchMeter icon appears on the right side of the Windows 95 Taskbar, near the clock. The appearance of the icon varies, depending on the amount of finger contact area (related to pressure) the Touch Pad mouse detects. The TouchMeter icon also allows rapid access to the standard Windows mouse control panel. To open the Touch Pad mouse Enhancements control panel, click this icon.

Scrolling Feature

The advanced scrolling feature (Virtual Scroll Bar) allows you to scroll through documents without moving the mouse away from your work. By simply sliding your finger up and down the right edge of the Touch Pad mouse, the contents of the current window will scroll. You no longer need to maneuver the cursor to the scroll bar – you can scroll no matter where the cursor happens to be.

Virtual Scroll Bar works with document windows, file lists, font lists, and other scrollable items. As a rule, you can use Virtual Scroll Bar when you're working in any window that has a scroll bar.

For a complete description of the configurable options for Virtual Scroll Bar, refer to the online help documentation included with the Touch Pad mouse enhancement software. To open the help file, right-click on the TouchMeter icon in the Taskbar, and select Help from the popup menu. (When the Corner Taps feature in the Touch Pad mouse Control Panel is enabled, right mouse button features can be accessed by tapping in the upper right corner of the Touch Pad mouse — see page 2-23.)

Cursor Control Feature

The advanced cursor control feature (Edge Finder) makes it easy to access the controls on the edges of windows. Many window controls, such as menu, close, and minimize buttons, scroll bars, and resize borders, lie around the edge. Edge Finder constrains the mouse cursor to stay inside the active window. The first time the cursor tries to move outside the window, it is held at the edge. The next time the cursor moves, it can leave the window. When Edge Finder is active, it is very easy to close or resize a window, or access the menus.

For a complete description of how to use Edge Finder, refer to the online help documentation included with the Touch Pad mouse enhancement software. (To open the help file, right-click on the TouchMeter icon in the Taskbar and select Help from the popup menu.)

Touch Pad Mouse Settings

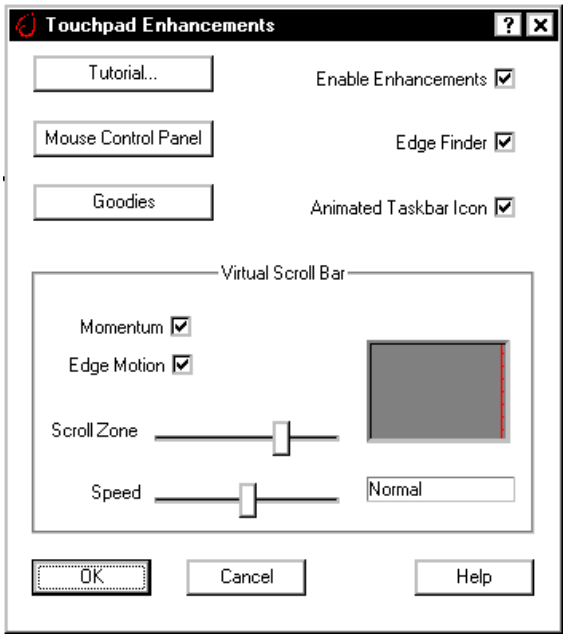
Your Glide Station system comes with the Touch Pad mouse configured and ready to use. The procedures in this section are required only if you want to change the Touch Pad mouse settings to suit your preferences.

The tutorial and configuration software provided with the Touch Pad mouse is already loaded on the Glide Station unit. The configuration software allows you to:

- Adjust touch sensitivity from light to heavy
- Turn edge motion on or off
- Select either 40 or 80 samples/second report rate

Click the TouchMeter icon in the Taskbar to open the Touch Pad Enhancements or use the Enhancements button on the TouchPad tab of the Windows Mouse Control Panel. The controls are described in the online Help documentation, which you can open by pressing the Help button at the bottom of the Touchpad Enhancements dialog box. You can also use the content-sensitive help feature (click the ? button on the title bar to obtain more information about all the controls).

A tutorial is included with the Touch Pad mouse to help you learn to use Virtual Scroll Bar. To run the tutorial, click the Tutorial button on the Touch Pad mouse Enhancement control panel. When the tutorial is running, Virtual Scroll Bar gives you feedback about its operation. You can leave the tutorial open while you work in other windows; the messages will continue to give feedback about your actions.

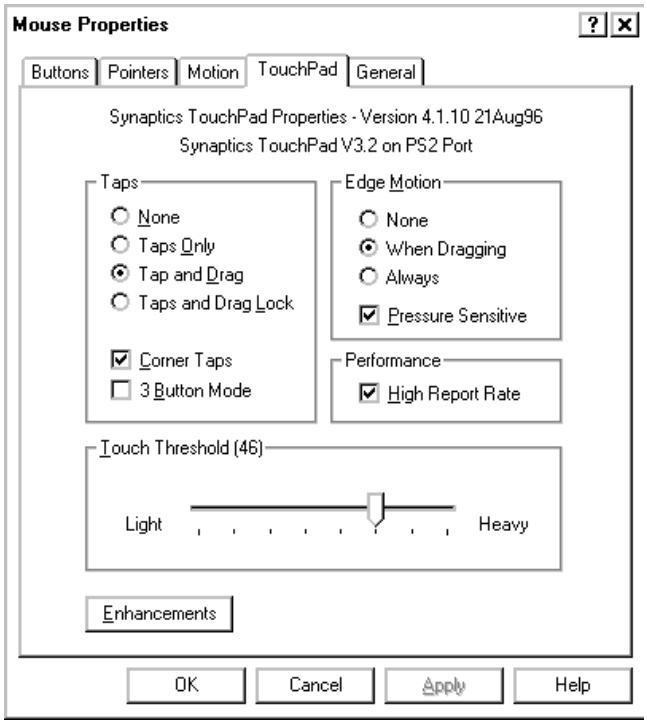


The following features can be accessed in the Touchpad Enhancements dialog box.

Table 2-4. Touch Pad Mouse Enhancement Features

Feature	Function
Tutorial button	Starts the tutorial for the Virtual Scroll Bar feature.
Mouse Control Panel button	Returns you to the TouchPad tab in the Mouse Properties dialog box.
Goodies button	Provides access to Mood Pad and Pressure Meter features.
Momentum check box	When checked, causes the Virtual Scroll Bar to continue scrolling a window after you have removed your finger from the scroll zone.
Edge Motion check box	When checked, causes the cursor to continue moving on the screen when your finger reaches the left or right edge of the Touch Pad mouse.
Scroll Zone slide bar	Allows you to adjust the width of the scroll zone on the Touch Pad mouse.
Speed slide bar	Allows you to adjust the speed at which the Virtual Scroll Bar scrolls.
Enable Enhancements check box	When checked, enables all of the Enhancement features.
Edge Finder check box	When checked, enables the Edge Finder feature.
Animated Taskbar Icon check box	When checked, enables the Touch Meter icon in the Windows Taskbar.

A Touch Pad tab is provided on the Mouse Properties dialog box, which you can open from the Control Panel or from the TouchPad Enhancements dialog box. The default settings are shown below.



The following features can be accessed on the TouchPad tab.

Table 2-5. Touch Pad Mouse Control Panel Features

Feature	Function
Taps selection boxes	The default selection is *Tap and Drag*. Changing this selection is *not* recommended. If Taps is accidentally disabled (None is selected), you will not be able to click on items.
Corner Taps check box	When checked, enables the right mouse button function in the upper right corner of the Touch Pad mouse.
3-Button Mode check box	Has no effect on Glide Station products.
Edge Motion selection boxes	Allow you enable/disable the Edge Motion feature and select its operating characteristics. (Edge Motion causes the cursor to continue moving when your finger reaches the left or right edge of the Touch Pad mouse.)
Pressure Sensitive check box	***This box must be checked*** for the Touch Pad mouse to operate correctly.
Performance High Report Rate check box	When checked, a report rate of 80 samples/second is selected. When not checked, 40 samples/second is selected. ***This box must be checked*** for the Touch Pad mouse to operate correctly.
Touch Threshold ( ) slide bar	The number in parenthesis changes with the setting. A setting of approximately 46 is recommended.
Enhancements button	Opens the Touchpad Enhancements dialog box.

How to Operate the Keypad

The keypad provided on Touch Station and Glide Station computers is shown in Figure 2-6.

Operation of the keypad is similar to that of a standard keyboard. The difference is that the keypad does not include all the keys of a QWERTY keyboard and typing alphabetic characters requires that you hold the FN key while pressing F1—F16 (on the machine control pad) and 0—9. Table 2-4 lists the keys and their functional equivalents on a PC keyboard.

The keypad also has 16 function keys. CIMPLICITY software allows you to create a procedure and assign it to a function key using CimEdit. (Refer to “Assigning a Key Sequence to a Procedure” and “Procedures” in Chapter 3 of GFK-1180.

The keypad is covered by a protective film that prevents damage from dust, moisture and solvents. Refer to Appendix F for specifications for the protective film.

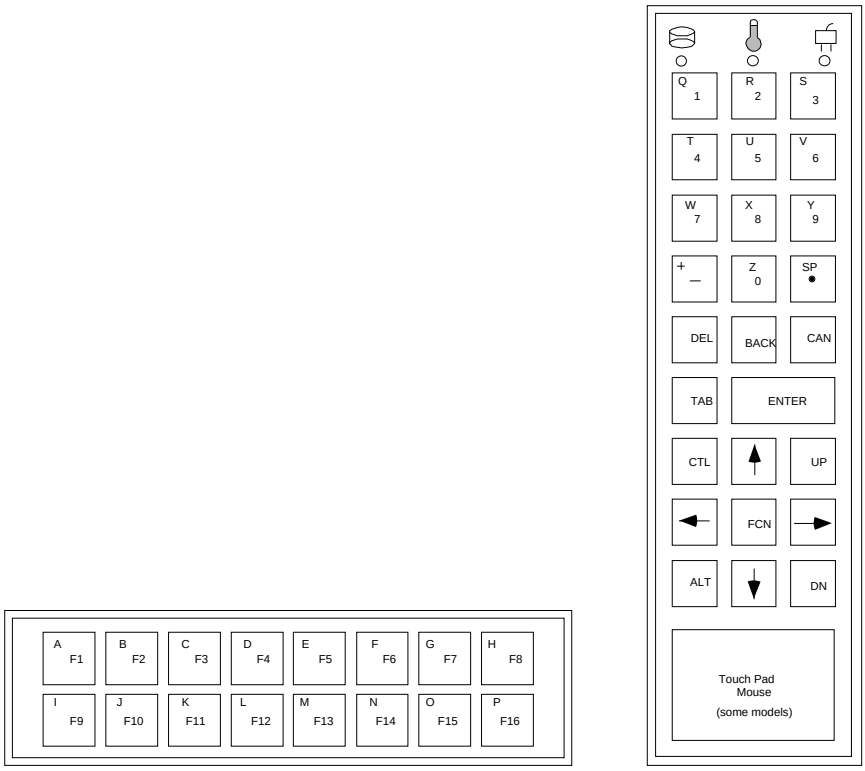


Figure 2-6. Keypad Layout

Table 2-6. Keyboard Key Functions

Keypad Key	PC Key Equivalent
1 .. 9	**1 .. 9**
F1 .. F8	**F1 .. F8**
F9 .. F16	**CTRL + F1 .. CTRL + F8**
-	**-** (minus or dash)
0	**0**
.	**.**
DEL	**DELETE**
BACK	← (backspace)
CAN	**ESC**
TAB	**TAB**
ENTER	**ENTER** ↵
CTL	**CTRL**
↑	↑ (up cursor key)
UP	**PAGE UP**
←	← (left cursor key)
FCN	function key
→	→ (right cursor key)
ALT	**ALT**
↓	↓ (down cursor key)
DN	**PAGE DOWN**

FCN + -	**+**
FCN + .	Space
FCN + F1 — F16	**A — P**
FCN + 1— 9, 0	**Q — Z**

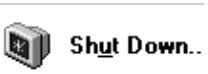
Shutting Down the Computer

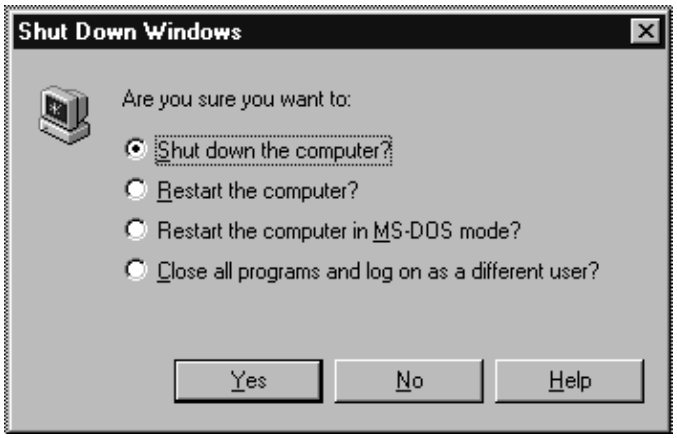
Caution

To avoid damaging files, always shut down Windows software before removing power from your Display Station product.

To shut down Windows 95:

1. From the Windows 95 Start menu, select the Shut Down option. The Shut Down Windows dialog box will appear. The default selection is Shut down the computer.





2. Click the Yes button.
3. Wait until the following message appears before removing power from the Display Station.

```
It's now safe to turn off your computer.
```

To shut down Windows NT:

1. In the Program Manager File pulldown menu, select the Shutdown option.
2. A dialog box with the following message will appear:

```
Shutting down will end your Windows NT session
and prepare your computer to be
turned off.
```

3. Select the Shutdown option and click OK.
4. Wait until the following message appears before removing power from the Display Station.

```
It is now safe to turn off your computer.
```

Moving the Display Station

The Display Station products should be mounted as described in “Hardware Installation.” If you need to move the unit, follow these instructions:

Caution

To avoid damaging files, always shut down Windows before removing power from your Display Station product. The procedure detailed on page 2-27 must be followed to ensure proper shutdown.

1. Shut down the Windows operating system.
2. Turn OFF all power on the computer and associated devices.
3. Disconnect all cords and cables from the Display Station. The Display Station must be completely disconnected before relocating it.
4. Remove the Display Station from its mounting location.
5. If there is a floppy disk in the disk drive, remove it.

Caution

For shipping, it is recommended that you pack the Display Station system using the original boxes and packing material, if available. When using different boxes, cushion the computer well to avoid damage.

Summary

When you have completed the unpacking, installation, and powerup procedures in this chapter, the setup for CIMPLICITY and Windows software should be complete. You can now copy a project from a CIMPLICITY Development system to this system, configure startup options, run the CIMPLICITY demo, or (if your system is licensed for CIMPLICITY Runtime and Development) create a new project.

To copy a project from a CIMPLICITY Development system, refer to Chapter 3. To configure startup options, run the demo or create a new project, refer to Chapter 4.

Chapter 3 Copying a CIMPLICITY Project to a Runtime System

If your CIMPLICITY Display Station is a runtime only system, you will need to copy a CIMPLICITY project to it from a CIMPLICITY runtime and development system. This chapter describes the options available for doing that.

A CIMPLICITY project is simply a collection of files and directories (see "CIMPLICITY Project Structure" on page 3-2). Moving the project requires copying those files and directories to the target runtime system. Any method you use that copies all the files and preserves the directory structure and file names will work. You ***cannot*** use a utility that is Windows 3.1/3.11 or DOS based because it will truncate CIMPLICITY file names to DOS 8.3 format.

In either a Windows NT or a Windows 95 system, projects can be copied from the CIMPLICITY Configuration Cabinet. If you have a Windows 95 system, you can use either the Direct Cable Connection utility or an Ethernet connection to copy projects. Because Direct Cable Connection is not supported in Windows NT, we recommend that you use an Ethernet connection to transfer projects for these systems.

You can also copy a project created on Windows 95 or Windows NT onto floppy disks. Projects can be transferred to a Windows NT based Display Station via floppy disk. However, the Windows NT Backup utility cannot be used for this purpose. Backup sets created on a Windows 95 system are not compatible with the Windows NT Backup utility.

The following topics are discussed in this chapter:

- CIMPLICITY Project Structure 3-2
- Copying a project from the CIMPLICITY Configuration Cabinet 3-3
- Setting Up a Network Connection with Direct Cable Connection (Windows 95 only) 3-4
- Copying a Project onto Floppy Disks 3-7

Note

We do *not* recommend copying a project while it is running. All files will be copied, but the project will not start properly. If this happens, delete the copy of the project, stop the original project, and copy it again.

CIMPLICITY Project Structure

When you create a CIMPLICITY project, a set of files and folders (directories) is created. The following window shows the files and directories within the project, HMI Project, which was created in the CIMPLICITY directory:

The standard project subdirectories are:

alarm_help	If you are creating operator Help files for alarms, put them in this directory
arc	If you are using the Database Logger option, archive files are put in this directory
data	All run-time configuration files reside in this directory
lock	The project lock files reside in this directory
log	All status log files, and program error files reside in this directory
master	All the master copies of configuration files reside in this directory
screens	All CimView screens reside in this directory
scripts	All Basic Control Engine scripts for this project reside in the directory by default.

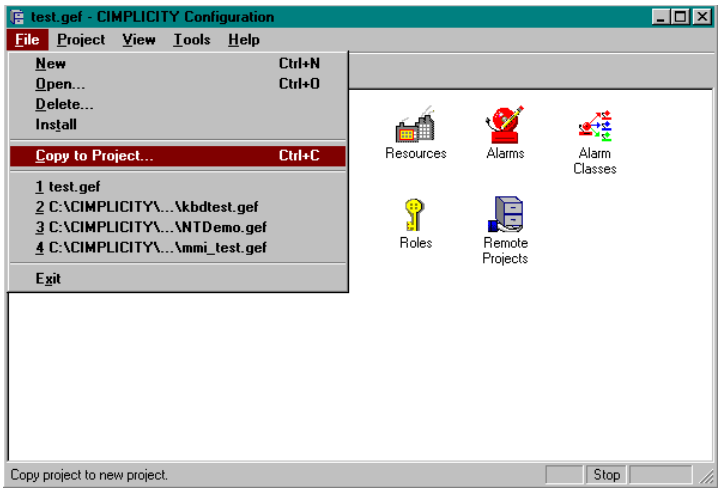
Refer to “Using CIMPLICITY Software” in the users manual (GFK-1180) for information about CIMPLICITY projects.

Copying a Project from the CIMPLICITY Configuration Cabinet

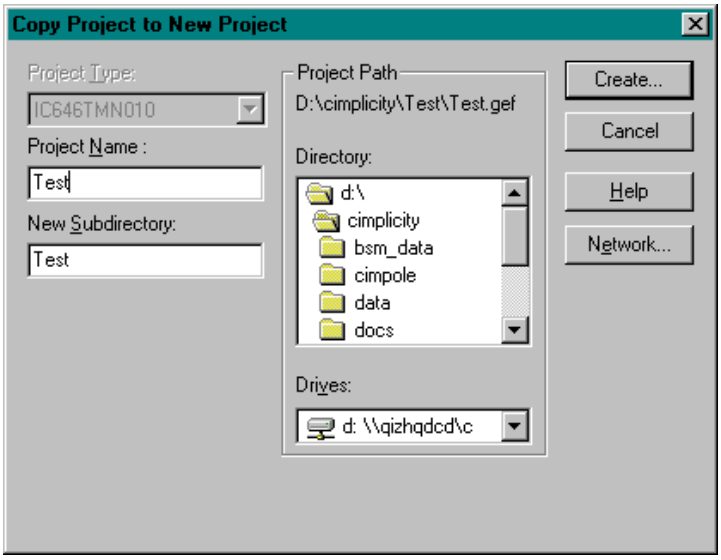
The easiest way to copy a CIMPLICITY project to a CIMPLICITY Display Station is from the CIMPLICITY Configuration Cabinet. Before attempting to copy, you must establish a network connection between the CIMPLICITY Development System and the Display Station. The connection can be either via Ethernet or, if your CIMPLICITY development system runs Windows 95, Direct Cable Connection. The following section describes the process of copying a project from the Configuration Cabinet. See page 3-4 for information on using Direct Cable Connection between a Development System and the Display Station.

To copy a project from the Configuration Cabinet, complete the following procedure:

1. Open the project and select the “Copy to Project...” command under the File menu:



2. When the Copy to New Project dialog box is displayed, select the disk drive on the target Display Station System, select the directory where the project will be copied, and enter the project name. Click the Create... button. The new project will be created on the target Display Station.



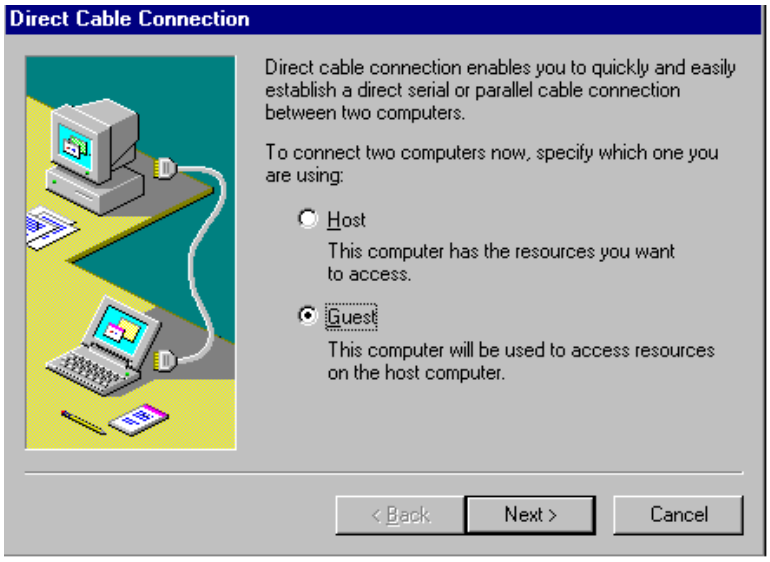
Setting up a Network Connection with Direct Cable Connection

The Windows 95 Direct Cable Connection utility provides a means of establishing a network connection between two Windows 95 systems via parallel or serial cables. This utility is installed and configured for use on your CIMPLICITY Display Station and on most laptops running Windows 95. It must also be installed and configured on your CIMPLICITY Development System before you can use it to transfer a project to your runtime system. (See Appendix C for information on installing and configuring Direct Cable Connection on your CIMPLICITY Development System.)

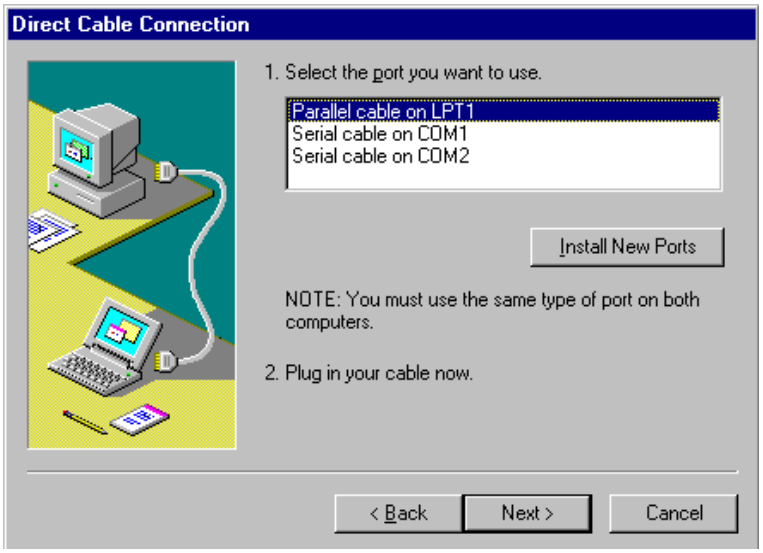
When Direct Cable Connection is set up on both your CIMPLICITY development and run-time systems, you can use it to establish a network connection and copy a project between systems. When you run Direct Cable Connection, it is recommended that you set up the CIMPLICITY HMI to be the Host computer with the CIMPLICITY development system as the Guest. When you have established a connection, files may be copied to the runtime system using the drag and drop capabilities of Windows 95. Projects can be copied to the CIMPLICITY Display Station using the Project Copy facility of the CIMPLICITY configuration cabinet.

Following are the steps for running Direct Cable Connection on the CIMPLICITY Display Station.

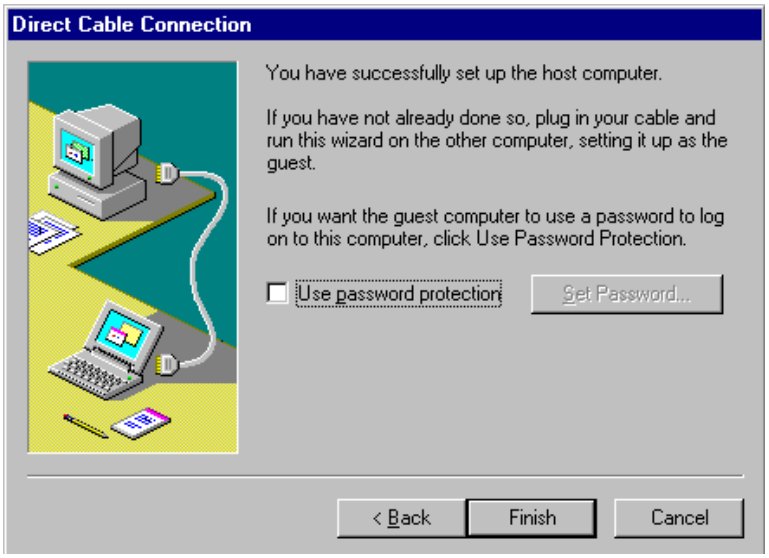
1. Connect the Parallel Technologies Windows 95 Direct Cable Connection cable to the parallel ports of the CIMPLICITY Display Station and the CIMPLICITY development system where the project is currently loaded.
2. Click the Start button.
3. Click the Direct Cable Connection icon in the Windows Start menu.
   The Direct Cable Connection dialog box will appear.


Direct Cable Connection
Direct cable connection enables you to quickly and easily establish a direct serial or parallel cable connection between two computers.
To connect two computers now, specify which one you are using:
Host
This computer has the resources you want to access.
Guest
This computer will be used to access resources on the host computer.
< Back
Next >
Cancel

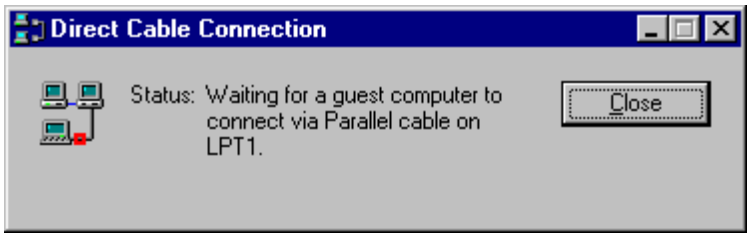
4. Click on Host or use the **TAB** key to select Host. Then select Next to continue. The system will display the following dialog box to set up a cable. This example assumes the use of the parallel port, but you could also use the serial cable connections with the appropriate cables.


Direct Cable Connection
1. Select the port you want to use.
Parallel cable on LPT1
Serial cable on COM1
Serial cable on COM2
Install New Ports
NOTE: You must use the same type of port on both computers.
2. Plug in your cable now.
< Back
Next >
Cancel

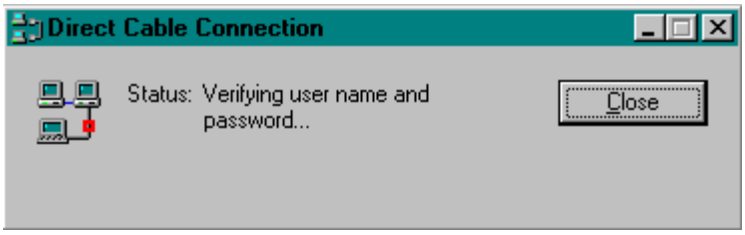
5. To select the Parallel port, click on Next to continue. The next dialog box will be displayed.


Direct Cable Connection
You have successfully set up the host computer.
If you have not already done so, plug in your cable and run this wizard on the other computer, setting it up as the guest.
If you want the guest computer to use a password to log on to this computer, click Use Password Protection.
Use password protection
Set Password...
< Back
Finish
Cancel

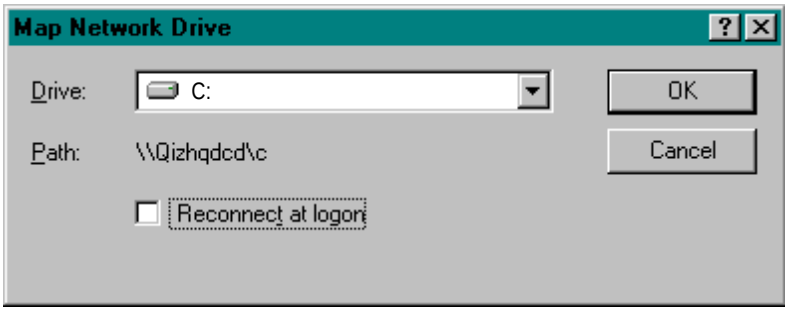
6. Click the Finish button. The CIMPLICITY HMI system will display the following message and will wait for another Windows 95 system to connect using Direct Cable Connection.



7. Repeat steps 1–6 on your CIMPLICITY Development System, selecting Guest in place of Host. When you have finished the initial setup for Direct Cable Connection, you will see the following message displayed:



8. When the connection is complete, the folder for the C drive will be displayed. Highlight the C drive on the Display Station and select Map Network Drive... from the File menu:



9. Click OK to map the network drive. Do not click on Reconnect at Logon unless you intend to keep the systems permanently connected.

Copying a Project onto Floppy Disks

If your project is less than 1.44 MB, you can simply copy the project folder to a single floppy disk using the standard file copy capabilities of Windows 95 or the File Manager in Windows NT.

To determine the size of your project:

Windows 95

In My Computer or Explorer, select the folder or files and select Properties from the File menu.

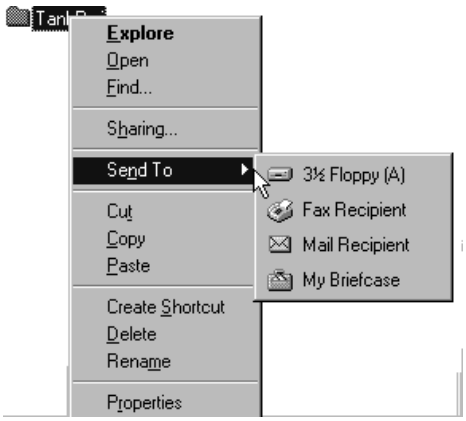
Windows NT

Open the File Manager in the Main program group. Double click on the folder for the project you wish to copy to view sizes of the files.

Windows 95 Systems

To make a copy of your project on floppy disks, do the following:

1. Select the project folder.
2. Click the Right Mouse button, and select the 3.5” floppy option.



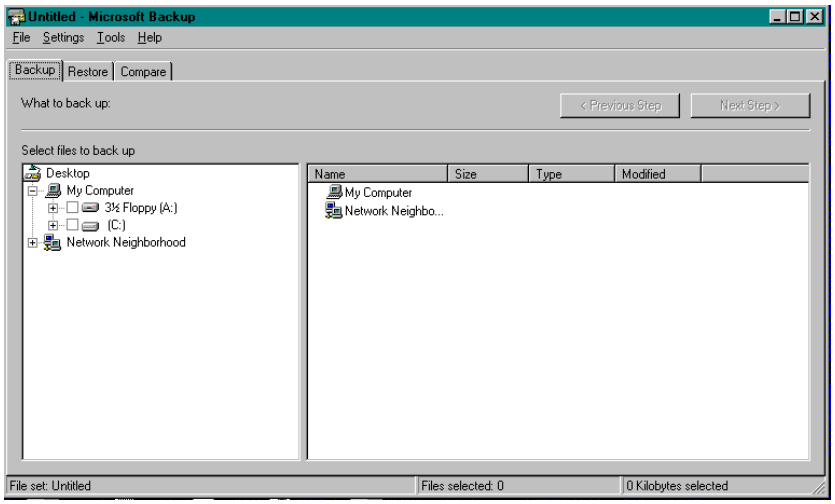
If your project is larger than (1.44 MB), Windows will copy the project to multiple floppy disks. You can also use the Windows 95 Backup utility to backup a project to floppy disk and then to restore the project to the Display Station. Windows 95 backup compresses data by default. For most projects, 5MB of project files will fit on a single floppy disk. If your project cannot fit on a single floppy disk, Windows 95 will backup the project over multiple floppy disks. If your project contains compressed data files (such as the .AVI file that is distributed with the CIMPLICITY Demo project) you will need more floppy disks.

To use the Backup utility:

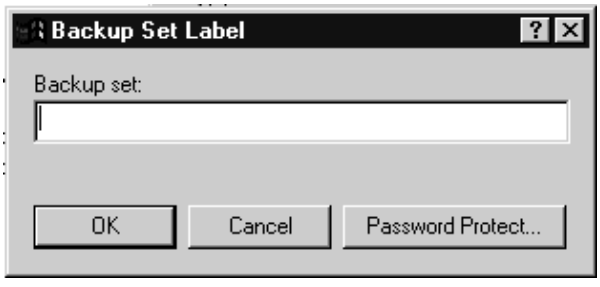
Note

The Windows NT Backup utility can only be used to transfer projects to systems that run Windows NT (IC751ATS350, BTS350, and BGP350). Backup sets created on a Windows 95 system are not compatible with Windows NT backup.

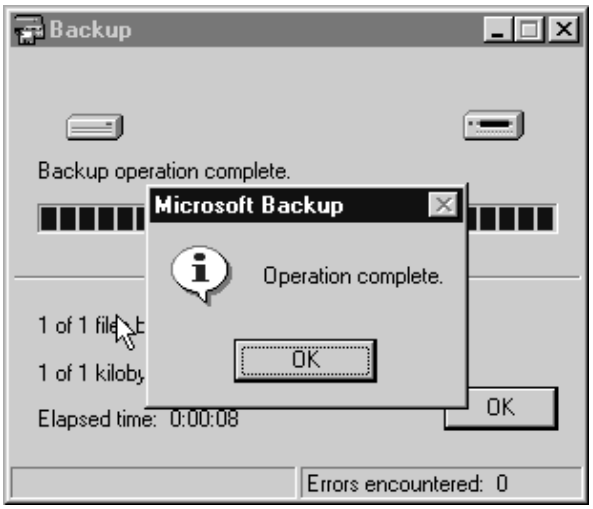
1. From the Windows 95 Start menu, select Programs, then Accessories, and System Tools.
2. In the System Tools menu, click the Backup icon. The Windows 95 Backup utility will start and the Microsoft Backup screen, with the Backup tab selected, will be displayed. (The first time you run backup, you will see several informational dialog boxes, which you can ignore.)



3. In the Backup tab, click the folder containing the files that you want to copy.
4. To select the files you want to copy, click a check mark in the box next to the file.
5. Click the Next Step> button. You will be prompted to select a destination.
6. Click the Floppy (A:) icon.
7. Click the Start Backup button. You will be prompted to enter a Backup Set Label.



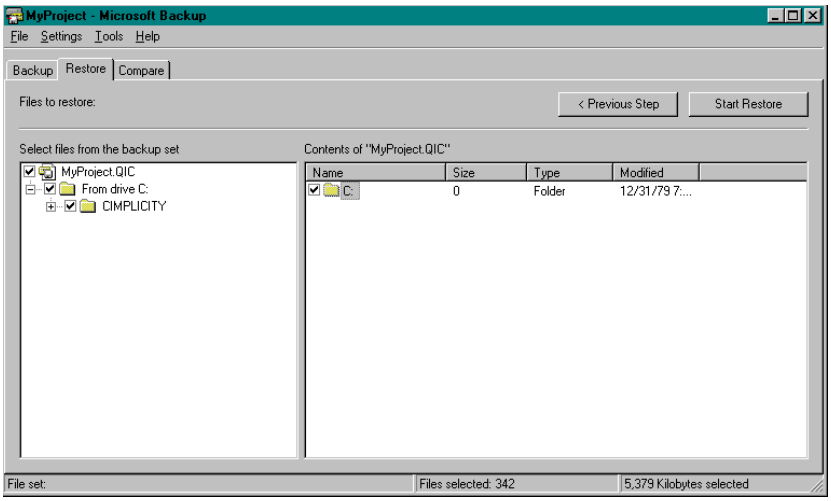
8. Type a label in the Backup set field and click OK. The Backup utility will finish the copy process and display an Operation Complete box.



9. Click OK twice to return to the Microsoft Backup dialog box.

To copy a project from floppy disks to your Display Station:

1. In the Microsoft Backup dialog box, select the Restore tab.
2. Click the backup set in the left hand column. (Be sure to select everything in the folder to be restored.) The project will automatically be restored to the same directory location as on the system where the project was created. For example, if the project was backed up from C:\CIMPLICITY\PROJECTS\MYPROJECT, it will be placed in that path by default.



3. Click Next Step to start restoring files to the target system.

Windows NT Systems

To make a copy of your project on floppy disks, do the following:

Note

If you are backing up a running project: There is a file that is locked when the project is running. This file will not be copied, and an error message to that effect will be displayed. You should ignore the message and continue the backup, as this file is created automatically whenever a CIMPLICITY project is started.

1. Open the File Manager in the Main program group.
2. Open two Windows, one for the drive where the CIMPLICITY project is located, and one for the floppy drive.
3. Locate the project directory for the project you want to back up
4. To save space on your floppy disk, you should delete all log files from the project's log directory before making the backup.
5. Copy the project's directory to the floppy drive. If more than one disk is needed, you will be prompted to insert another disk.

Chapter 4

Running CIMPLICITY Software

This chapter provides an overview of CIMPLICITY HMI software to help you get started. For detailed instructions for operating the software, refer to GFK-1180. The topics presented in this chapter describe how to perform the following tasks:

- Setting CIMPLICITY Options 4-2
- Starting CIMPLICITY Automatically at Bootup 4-7
- Starting CimView Manually 4-12
- Creating a New Project 4-16
- Running the Demo Project 4-21
- Changing the Computer Name 4-22

Setting CIMPLICITY Options

To configure CIMPLICITY options, or to start or stop projects, select the CIMPLICITY Options icon from the CIMPLICITY folder. The CIMPLICITY Options dialog will open. You can use this dialog to:

- Halt a currently running project on your Server.
- Start a project on your Server.
- Start a project as a Viewer.
- Select a default project to be run on your Server.

You can also:

- Display the currently running projects on Servers in your network.
- Halt a currently running project on a Server in your network.
- Start a project on a Server in your network (subject to restrictions).

Setting Project Options

Use the Projects properties to display, start, and stop projects on a computer.

When you open the CIMPLICITY Projects dialog, it is connected to your computer and shows you the currently running projects as well as the projects available for running.

You can:

- Start as a Viewer.
- Connect to another computer in your network
- Stop a running project
- Add projects to the list of projects
- Start projects in the Projects list.

Start as a Viewer

To start as a Viewer, select Start Viewer. When you do this, only the Router starts on your computer.

Connecting to Another Computer

Important

You can only connect to a project on a remote computer in Windows NT.

You can display the projects currently running on any Server in your network. To do this:

1. Click the drop-down list button to the right of the Computer Name field.
2. Select the computer you want to connect to from the list of computers that are currently running CIMPLICITY software. If the computer name does not appear in the list, you can type it in the Computer Name field.
3. Select Connect.

The projects that are currently running on that computer are displayed in the Running Projects field.

Stop a Running Project

You may stop any project that is currently running the computer you are currently connected to.

To halt a running project:

1. Select the project in the Running projects list.
2. Select Stop. A confirmation dialog opens.
3. Select Yes to confirm that you want to proceed with the shutdown.

After the project is halted, the project is removed from the Running projects list.

Add a Project to the Projects List

You may add projects to the Projects list. To do this:

1. Select Add. The Open dialog opens.
2. Use the *Open* dialog to search for the project (.gef) file you want. When you find it, select OK.

The project you select is added to the Projects list.

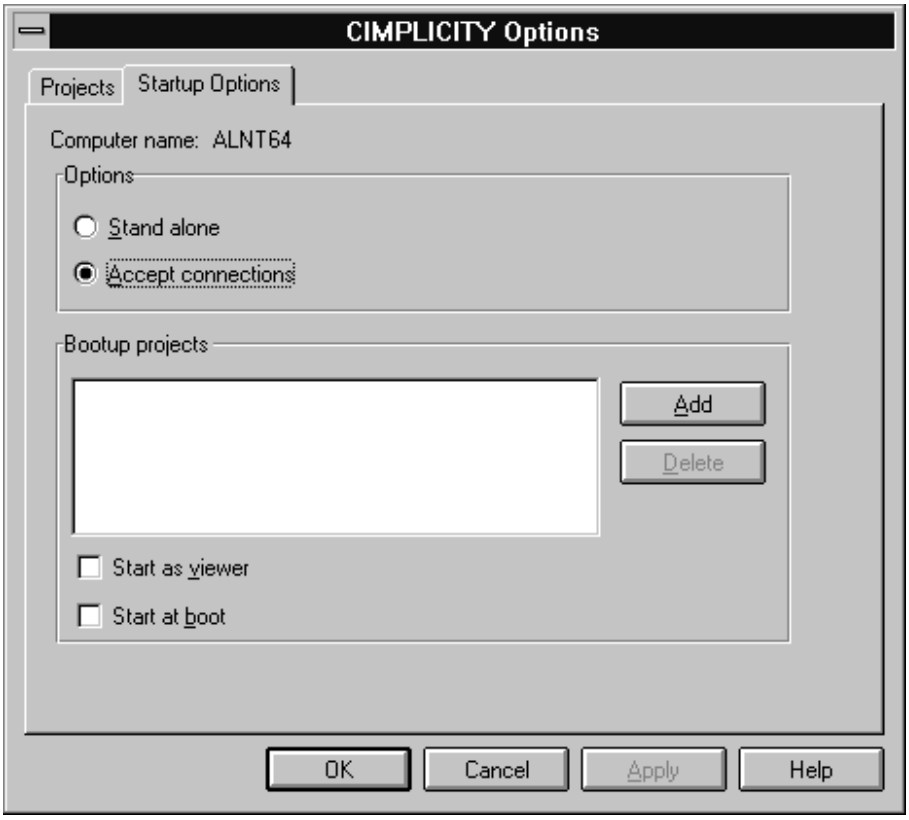
Start a Project in the Projects List

To start a project in the Projects list:

1. Select the project.
2. Select Start.
3. Verify that you want to start the project.

The project you select is started. When startup is complete, the project name is listed in the Running projects list.

Setting Startup Options



Use the Startup Options page to

- Set the connection options for the computer.
- Select projects to start at computer bootup.

Setting Connection Options

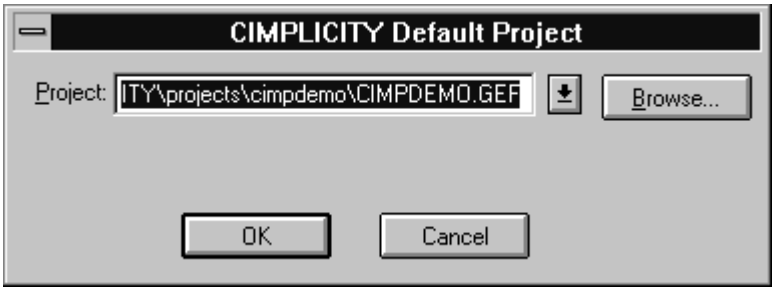
You can select one of the following options:

Stand alone	Select this option if you do not want to connect to other projects in your enterprise, and you do not want other projects in your enterprise to connect to this project.
Accept connections	Select this option if you want to connect to other projects in your enterprise and you want other projects to connect to this project.

Selecting Bootup Projects

Bootup projects are projects on your computer's local drive that you want to start when the computer boots.

To add a project to the list of Bootup projects, select Add. The CIMPLICITY Default Project dialog opens.



Use this dialog to browse for projects to add to your list of Bootup projects. When you locate a project, select OK to add it to the list and close the CIMPLICITY Default Project dialog. Select **Cancel** to close the dialog without selecting a project.

To delete a project from the Bootup projects list, select the project, then select Delete. The project is removed from the list.

You can also select the following check boxes:

Start as viewer	This check box is checked automatically if you have chosen Start at boot, and no projects have been added to the Bootup projects list. At bootup, the system will start as a Viewer (that is, only start the Router).
Start at boot	This check box is always enabled. Select this check box if you want to projects in the Bootup projects list to start when the computer boots. If there are not projects in the list, only the Router starts.

Starting CIMPLICITY Automatically at Bootup

On a Windows 95 system, you can configure a CIMPLICITY HMI project to automatically start at system boot and display an initial CimView screen. To do this you will need to:

- Disable the Microsoft Network Login prompt
- Set the CIMPLICITY startup options to start a project and load an initial CimView screen.

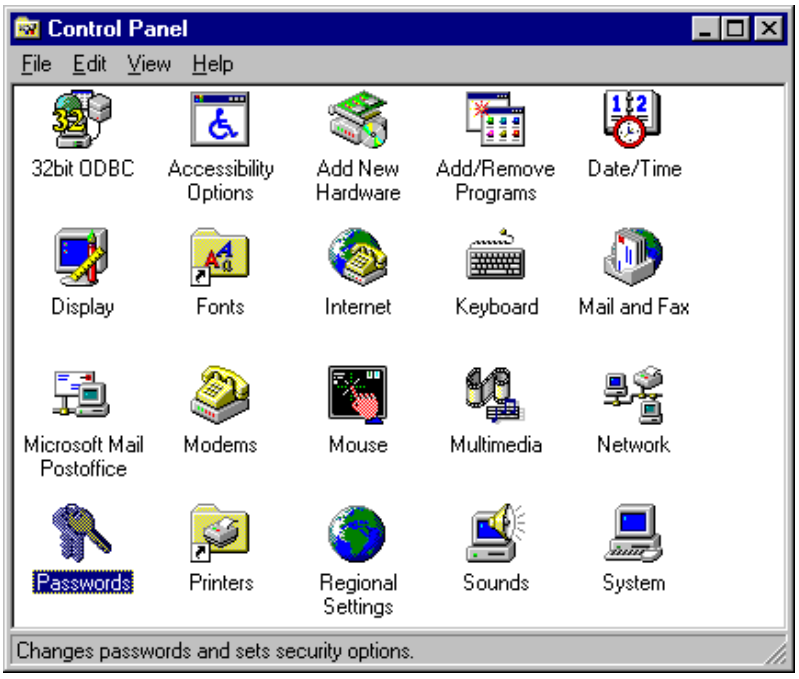
Note

In Windows NT systems, CimView cannot be started at boot time using the CIMPLICITY Startup Options application. To set Windows NT up for automatic login, see "Enabling/Disabling Automatic Login in Windows NT" in Appendix E.

Disabling the Network Login Prompt (Windows 95 Systems)

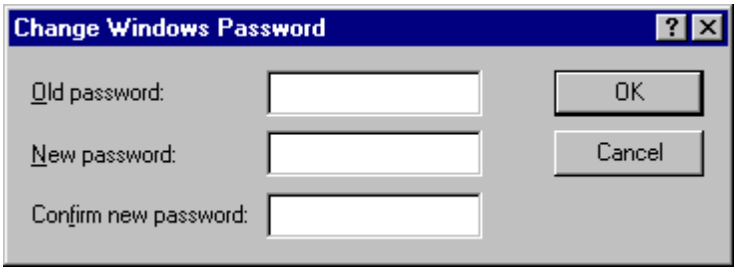
To have your Display Station start CIMPLICITY and CimView when the unit boots up, you must first bypass the Microsoft Network Login prompt. To do so:

1. Log on to the Display Station (Microsoft Network login) with a user ID that is *identical* to the CIMPLICITY user ID. We recommend that you log on as Administrator when you power up the system. Doing so eliminates the requirement to log on the CIMPLICITY when you run the CIMPLICITY Demo or any other CIMPLICITY project that includes a user named Administrator. All CIMPLICITY projects are configured with an Administrator user by default.
2. Open the Control Panel and click the Passwords icon.



The Passwords Properties dialog box will be displayed.

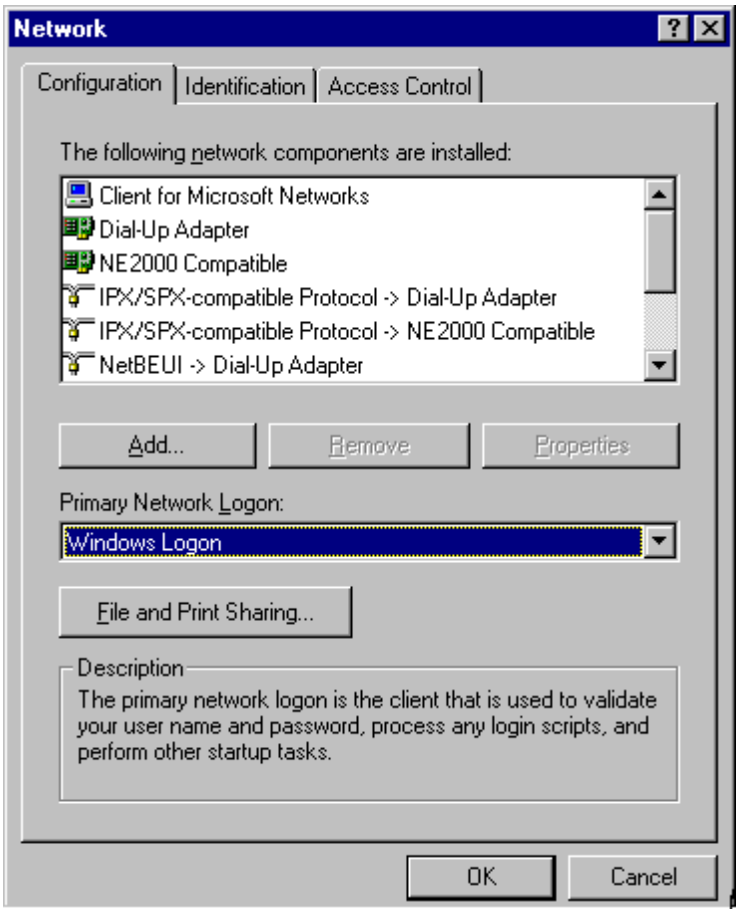
3. Click the Change Windows Password button.



4. Enter the old Password (or leave it blank if you never entered a password). Leave the New Password and Confirm New Password fields blank. And click OK. The Change Windows Password dialog closes.

5. Close the Passwords Properties dialog by clicking OK.

6. Click the Network icon in the Control Panel. The Network properties dialog box will be displayed.



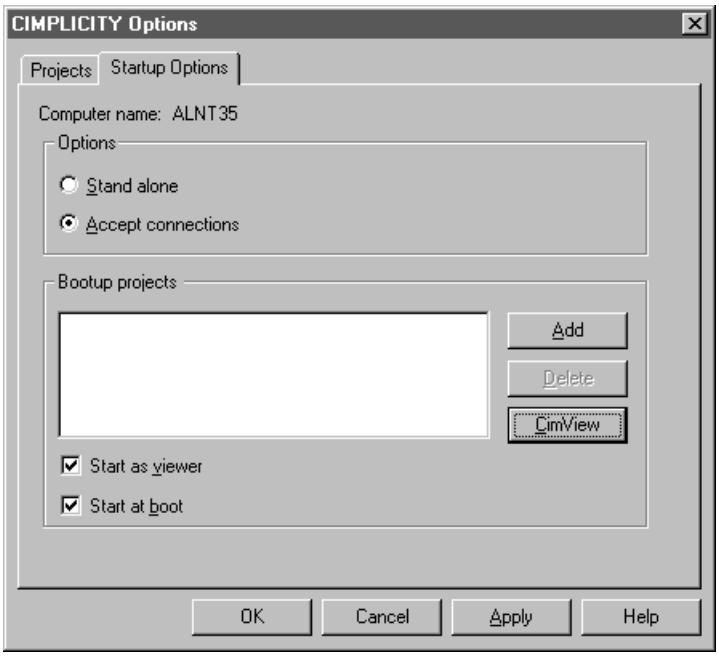
7. In the Primary Network Logon field, select Windows Logon.

8. Click OK. You will be prompted to reboot your system so that changes will take effect. After you have rebooted, you will no longer be prompted to log on.

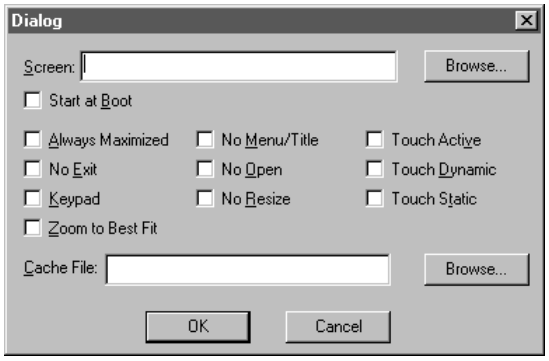
Setting CIMPLICITY Startup Options

Select CIMPLICITY Options from the CIMPLICITY shortcut menu. The CIMPLICITY Options dialog opens.

1. Select the Startup Options page.



2. In the Options box, select whether you want to start a stand alone project, or accept connections from other projects in your enterprise.
3. In the Bootup projects box:
   A. Make sure the project(s) you want to start a system boot are listed in the Bootup projects list. To browse for projects and add them to the list, click the Add button.
   B. Select the Start at boot check box.
   C. Select CimView to set a default CimView screen and display options. The Dialog dialog box opens.



D. Enter the starting CimView screen in the Screen field. You can also select Browse to the right of this field to search for the screen you want.

E. Click an "X" in the Start at boot field if you want the CimView screen to be started automatically when the system boots.

F. Click an "X" in the following fields as needed:

Always Maximized	This option always maximizes the initial window to fill the user's terminal screen. The user cannot resize the primary window, and the window will not rise to the top when a user clicks on it (this prevents it from obscuring other windows on the terminal screen).
No Exit	This option does not let the user exit the primary CimView window. The Exit menu item is removed from the File menu, and the Close menu item and Alt+F4 shortcut key are removed from the Control menu. Also, the Close Screen action is ignored in the primary window.
Keypad	This option opens the popup keypad whenever the user needs to enter data for Variable setpoints. This option is required for systems with no keyboard or keypad. **For Touch Display systems:** Select the Keypad option to enable a popup keypad for entering values for variable setpoints.
Zoom to Best Fit	This option sizes the CimView screen to best fit the window in which it is displayed.
No Menu/Title	This option removes the Menu and Title bars from the primary CimView window and all subsequent windows. **For Touch Display systems:** If you select the No Menu/Title option, you must include a Close procedure in your CimView application. For example, on some screens, include a button that executes a CLOSE procedure to close the CimView window.
No Open	This option prevents users from opening CimView screens not explicitly identified in Open Screen or Overlay Screen procedures. Open and Open Window menu items are removed from the File menu and the File Open toolbar button is disabled.
No Resize	This option prevents users from resizing CimView windows that are displayed.
Touch Active	Keeps CimView screens currently being displayed swapped in. Without this flag, only documents in the cache are touched periodically to keep them swapped into memory.
Touch Dynamic	Keeps CimView screens with many dynamic objects swapped into memory.
Touch Static	Keeps CimView screens with many static objects swapped into memory.

For more information about these options, see the *CIMPLICITY HMI for Windows NT and Windows 95 CimEdit Operation Manual* (GFK-1396).

G. If you want to pre-load the screen cache with selected files, enter the name of the cache file in the Cache File field. You can also select Browse to the right of this field to search for the cache file you want.

H. Select OK to save your changes and return to the CIMPLICITY Options dialog, or select Cancel to close the *Dialog* dialog and return to the CIMPLICITY Options dialog without making any changes.

4. Select OK to save the startup options and close the CIMPLICITY Options dialog.

Selecting a Default Project and CimView Options

Note

In Windows NT systems, CimView cannot be started at boot time using the CIMPLICITY Startup Options application.

This procedure configures a default project and CimView to start automatically at bootup. Projects and CimView can also be started manually. See "Starting a Project" (page 4-12) and "Starting CimView Manually" (page 4-12).

Starting CimView Manually

You can customize the Start menu so that, when you start CimView, it will automatically open with a specific screen and with various options enabled. These CimView start options are configured by editing the command line in the CimView Properties Shortcut screen. The command line format is:

cimview.exe <option> <pathname> [<pathname>...]

The options are recognized only when they are used with the primary (first) CimView window you launch. If multiple CimView screens are launched from a single command line and command line options are used, the first screen in the list is considered to be the primary window. For example, if the option */alwaysmaximized* is used, the first screen in the list will be maximized, and all other screens will be displayed in their normal windows. The following command line options can be associated with a CimView icon:

Argument	Description
/alwaysmaximized	Displays the primary CimView window in a maximized state. You will not be allowed to resize the primary window. The window will not rise to the top when you click on it (this prevents it from obscuring other windows on your terminal screen). This option is only applied if it is used with the first **CimView** window opened. This window is known as the primary window. If used with subsequent open commands, it will be ignored.
/keypad	Displays a keypad window on the user's screen whenever the user has to perform a Variable Setpoint action in a procedure. To enter a new setpoint value, the user clicks on the appropriate keys in the keypad window rather than entering them from a keyboard. This option is only applied if it is used with the first CimView window opened. This window is known as the primary window. If used with subsequent open commands, it will be ignored. **For Touch Display systems:** Select the Keypad option to enable a popup keypad for entering values for variable setpoints.
/noexit	Will not let you exit the primary CimView window. The Exit menu item is removed from the File menu, and the Close menu item and its Alt+F4 shortcut key are removed from the Control menu. Close Screen actions are ignored in the primary window. This option is only applied if it is used with the first CimView window opened. This window is known as the primary window. If used with subsequent open commands, it will be ignored.

/nomenutitle Removes the Menu Bar and Title Bar from the primary CimView window and all subsequent windows that you open.

This option is applied to the new windows and also any windows that are opened from within CimView. If a later CimView command is executed without the option, the option is disabled for those windows and any new windows opened from within CimView.

For Touch Display systems: If you select the No Menu/Title option, you must include a Close procedure in your CimView application. For example, on some screens, include a button that executes a CLOSE procedure to close the CimView window. In this case you should not select the /NoExit option since that will prevent the Close procedure from functioning.

/noopen Lets you open only the CimView screens that are explicitly mentioned in Open Screen and Overlay Screen actions. Open Screen and Overlay Screen actions that do not specify a screen are ignored.

In addition, the Open and Open Window menu items and the file list are removed from the File menu, and the File Open Toolbar button is disabled.

This option is applied to the new windows and also any windows that are opened from within CimView. If a later CimView command is executed without the option, the option is disabled for those windows and any new windows opened from within CimView.

/noresize Prevents you from resizing any CimView windows that you display.

This option is applied to the new windows and also any windows that are opened from within CimView. If a later CimView command is executed without the option, the option is disabled for those windows and any new windows opened from within CimView.

/project <name> Sets the base project to <name>.

The data for all *unqualified* points on the windows you display will be requested from the named project.

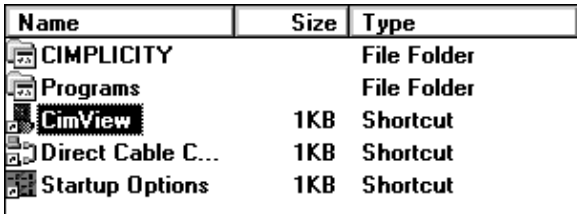
This option is applied to the new windows and also to any windows that are opened from within CimView. If a later CimView command is executed without the option, the previous value for the default project continues to be used.

/zoomtobestfit Initially places the primary CimView window in Zoom To Best Fit mode. All subsequent windows are also displayed in this mode.

This option is applied to the new windows and also any windows that are opened from within CimView.

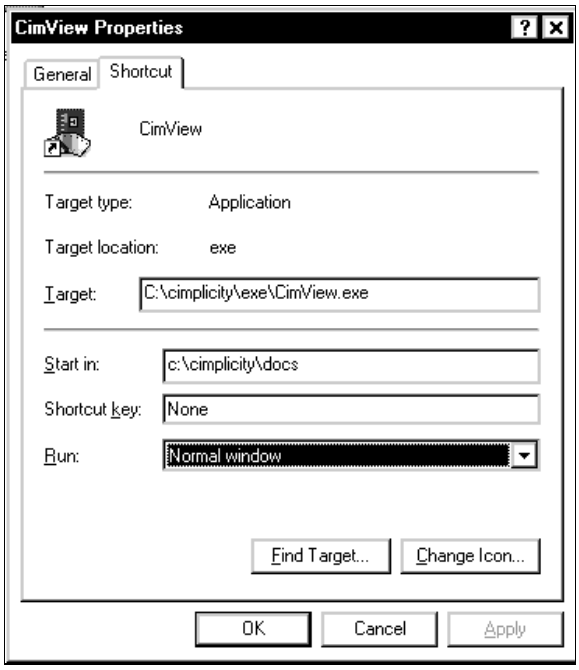
Setting Command Line Options for Windows 95 Systems

1. In Windows Explorer, open the folder Start Menu in the path C:\Windows\.
2. Click (highlight) the file CimView.exe.
3. Select Properties from the Explorer File menu and then click the Shortcut tab. In the field labeled Target, you should see a command similar to the following:




```
c:\cimplicity\CimView.exe /Keypad C:\cimplicity\Myproject\StartScreen.cim.
```

4. Edit the command line in the Target field to include the options and project screen that you want to use. In the example above, the Keypad option is specified. The screen that will be automatically launched is StartScreen.cim in Myproject.
5. Click the Apply button and then click OK to enable this option.



6. When you have this option enabled, CimView will start with the specified screen and with the Keypad option. If CIMPLICITY is not running when you start CimView, you will be prompted to start the project associated with the screen.

For more information about CimView, see the chapter, “Using CimView” in the CIMPLICITY HMI Base System User’s Manual (GFK-1180).

Setting Command Line Options For Windows NT Systems

Installing A Screen for CimView

Once you have saved a CimEdit screen, you can use the Install option on the CimEdit File menu to install the screen in a program group for users to access.

When you select Install from the File menu, the Program Groups dialog box is displayed.

You can select the program group from the list of existing program groups, or you can enter the name of a new program group in the Program Group input field.

When you click OK, the CimView icon for the screen will be placed in the program group that you specify. If you entered the name of a new program group, the group will be created and placed in the Program Manager.

Using Command Line Options for Installed Screens

Once you have installed a CimView icon in a program group, you can add arguments to the command line to control user access.

To add arguments to the command line for an icon:

1. Click the CimView icon to select it.
2. Select Properties... from the File menu in the Project Manager. The Program Item Properties dialog box will open.
3. Insert the option (or options) you want between the executable name and the CimView screen name in the Command Line input field. (See the table on page 4-12.)

For more information, refer to “Installing a Screen for CIMView” and “Using Command Line Options for Installed Screens” in the “Using CimEdit” chapter of the CIMPLICITY HMI Base System User’s Manual (GFK-1180).

Creating A New Project

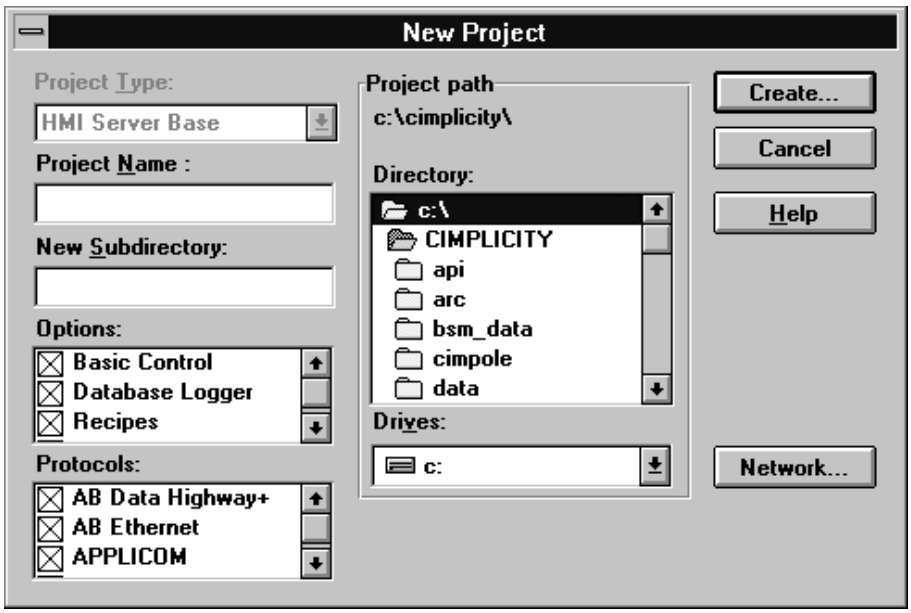
To create a new local or remote project, double-click the New Project icon in the CIMPLICITY shortcut menu. The project creation procedure displays a series of dialogs that let you:

- Select the project type, name, and path.
- Set project properties.
- Use the project wizard to do initial configuration of ports, devices, and points for the new project.

When the creation procedure is complete, select Install from the File menu to install the project in a folder.

New Project Options

When you create a new project, the New Project dialog opens.



Enter information in the following fields to create a new project:

Project Type	Select the type of project you want to create. The type of project you can create is controlled by the product option you have installed. For example, if you have installed the HMI Server option, then you can only create HMI Server base projects.
Project Name	Enter the project name in this field.
New Subdirectory	The project name you enter will also be used as the default subdirectory name for the project. If you want to use another name for your subdirectory, enter it in this field.
Options	You can select the options you want to be available in this project from the list of all installed options. Click an "X" in the box for each option you want to select.
Protocols	You can select the protocols you want to be available in this project from the list of all installed protocols. Click an "X" in the box for each protocol you want to select.
Project Path	Use the Drives and Directory input fields to select a directory path for the project directory you are creating. If you want to create the project on another disk in your network, click Network... to define the network path.

When you have entered your information, click Create... to create the new project or click Cancel to cancel the create request.

When you click Create..., the Configuration Cabinet for the project is created, and the Project Properties dialog opens to display the Options properties.

Setting Project Properties

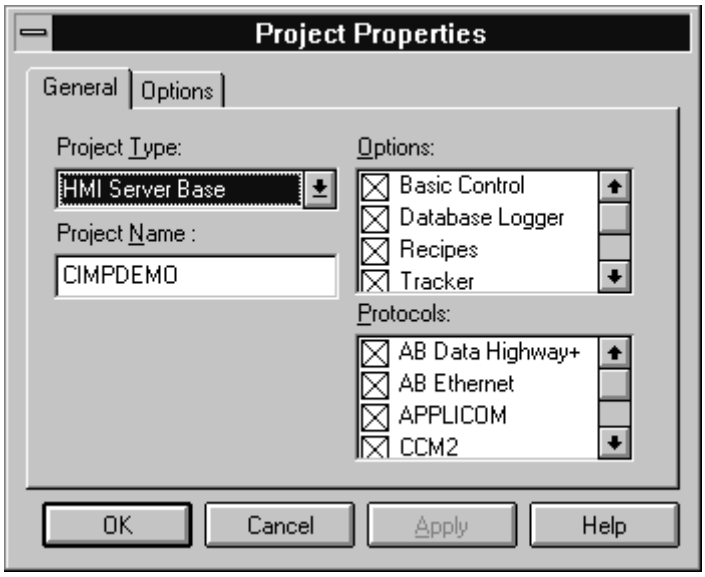
The Project Properties dialog opens when you:

- Are creating a new project, and you click Create... from the New Project dialog box.
- Select Properties... from the Project menu for a project.
- Click the Settings button on the project Toolbar.

Use the Project Properties to choose or change general properties and options for a project.

After you have modified the properties, you can select OK to accept the modifications, or select Cancel to close the Project Properties without accepting any changes.

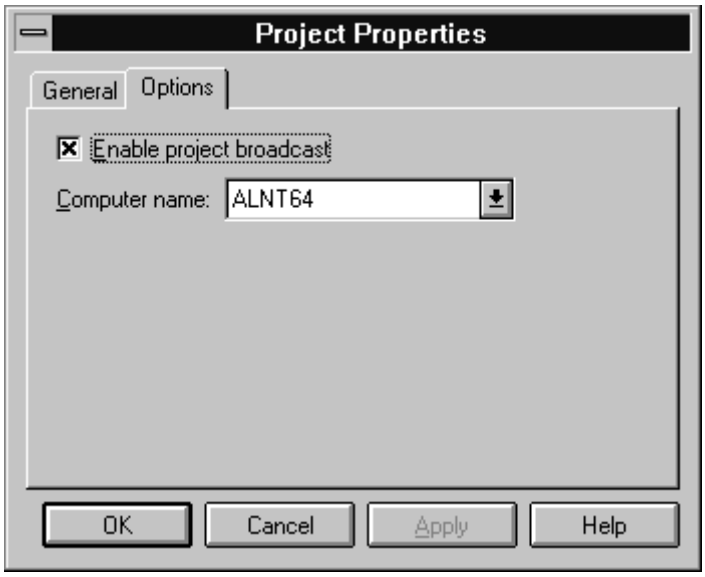
General Properties



The General properties you can change are:

Project Type	If you want to change the project type, enter the new type in this field. Use the drop-down list button to the right of the input field to display the list of currently available project types and select the one you want.
Project Name	If you want to change the project name, enter the new name in this field.
Options	Select the options you want for this project from the list of available options. Click an "X" in the box to select an option. Otherwise, click the box blank.
Protocols	Select the device communication protocols you want to use for this project from the list of available protocols Click an "X" in the box to select an option. Otherwise, click the box blank.

Options Properties



The Options properties you can change are:

Enable Project Broadcast	Click an "X" in this box if you want to broadcast the project name on the network. When you broadcast the project name, users on other nodes that request point data can use the project name in fully qualified points. Otherwise, they can only use the node name in fully qualified points.
Computer Name	Select the computer the project is to run on when the project is started. For all installations, you may run the project on your computer.

Using the Project Wizard

The Project Wizard dialog opens when you:

- Are creating a new project, and you click OK from the Program Groups dialog box.
- Select Project Wizard... from the Project menu for a project.
- Click the Project Wizard button on the project Toolbar.
- Press Ctrl+W in the project.

You can use the Project Wizard to define ports, devices, and points for a project.

Installing A Project

Once you create a project, you will want to install it in a folder for easy access. To do this, in the Configuration cabinet for your project:

1. Select the File menu.
2. Select Install.

The Folders dialog opens and lets you select the folder where you want to install the project.

Enter information in the following fields:

Program Group Enter the name of the program group where you want to install the project. The default program group will have the same name as your project. You can choose to keep that name, enter a new name, or select a name from the Existing Groups list.

Select OK to install the object in the program group, or select Cancel to continue the installation without installing the object into a program group.

When you select OK, the program group for your project will be created and placed in the Program Manager, and the Configuration cabinet for your project will be put in the program group.

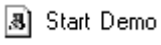
Running the Demo Project

Note

You will need to use a keyboard to logon to the demo project. Before running the demo, attach a standard PS/2-type keyboard to the KEYBD port on the Touch Display system.

A Demo project that showcases the features of CIMPLICITY HMI software is automatically loaded with your installation unless you select otherwise. To start the Demo project:

On a Windows NT system, open the CIMPLICITY HMI program group, then select the Start Demo icon.



On a Windows 95 system, click **Start**, select Program from the Start menu, select CIMPLICITY from the Program menu, then select the Start Demo icon.

When the Select CIMPLICITY Project dialog opens:

1. Select the CIMPDEMO project.
2. Select Start. The Starting CIMPDEMO dialog opens and displays the status of the CIMPLICITY processes as they start.
3. Wait for the CIMPLICITY Login dialog to be displayed.
4. Enter ADMINISTRATOR in the Username input field and click OK.
5. When the main menu screen opens, select any topic to proceed.

Changing the Computer Name

If you change the Computer Name of your Display Station, you will be prompted to reboot the system so that the change may take effect. When you are prompted, **respond by selecting No**. Then, shut down the system and reboot using the Shutdown option on the Windows 95 Start Menu or the Windows NT File menu. **If you select Yes at the prompt, the system will fail to reboot in its initial attempt. If this occurs, simply reboot the system again and select a Normal reboot from the menu**.

Computer names must be less than or equal to ten characters to run CIMPLICITY software. To verify that your computer name is the correct length:

- For Windows NT systems, use the Network Settings option in the Control Panel program group.
- For Windows 95 systems, use the Network option in the Control Panel program group.

In Windows 95 systems, for Viewers and HMIs to be able to browse remote nodes, the local computer name must be entered into the `/WINDOWS.000/HOSTS` file.

Chapter 5 Installing Upgrades

Up to 32MB memory can be installed in a Display Station product. All CIMPLICITY Display Station products contain two SIMM (single in-line memory module) slots, each of which can be filled with a 4, 8, or 16MB SIMM. Systems that have 16MB memory are shipped with one SIMM installed, so that a SIMM slot is available for an upgrade. These systems can be upgraded to 24MB by installing an 8MB SIMM or to 32MB by installing a 16MB SIMM.

An ISA-compatible board can be installed in Glide Station and Touch Station products. These products feature a removable plate, located below the port connectors, that can be modified to provide cable access to the ISA board (Figure 1-3).

The following topics are covered in this chapter:

- Opening the Rear Panel 5-2
- Installing a Memory Upgrade 5-2
  - Specifications 5-4
  - Installation Procedure 5-5
  - Removal Procedure 5-8
- Installing an ISA-Compatible Board 5-9
  - Specifications 5-9
  - Installation Procedure 5-9
  - Removal Procedure 5-11

Opening the Rear Panel

1. If a floppy disk is installed in the disk drive, remove it from the drive.

Caution

To avoid damaging files, always shut down Windows before removing power from your Display Station product.

2. Shut down the Windows operating system (see “Shutting Down the Computer” in Chapter 2).
3. Turn OFF all power to the computer and associated devices.
4. Disconnect all cords and cables from the Display Station.
5. Remove the Display Station from its mounting location and place it display-side-down on a padded work surface.

Caution

This procedure should be performed in a clean, dust-free environment.

Caution

The rear panel must be supported when you remove it from the Display Station enclosure.

The hardware components that are mounted on the rear panel are connected by cables to circuit boards in the unit enclosure. Careless handling could dislocate or damage cabling or components.

Before disassembling your Display Station:

To avoid placing strain on cables and components, make sure the rear panel is securely supported at all times. (Cable lengths may not allow removal of the rear panel from the Display Station enclosure.) We strongly recommend having another person steady the rear panel while you are working inside the enclosure.

In some Touch Display products, cable lengths will allow placing the rear panel on the work surface directly next to the enclosure. Before disassembling these units, make sure that there is room to place the panel on your work surface.

6. Open the rear panel.

   A. Remove the 14 Phillips-head screws from around the outside edge of the rear panel. Do *not* remove other screws, which secure hardware components that are mounted on the inside of the rear panel.

   B. To free the rear panel from the unit enclosure, insert a small flat blade screwdriver under the edge of the rear panel (Figure 5-1).

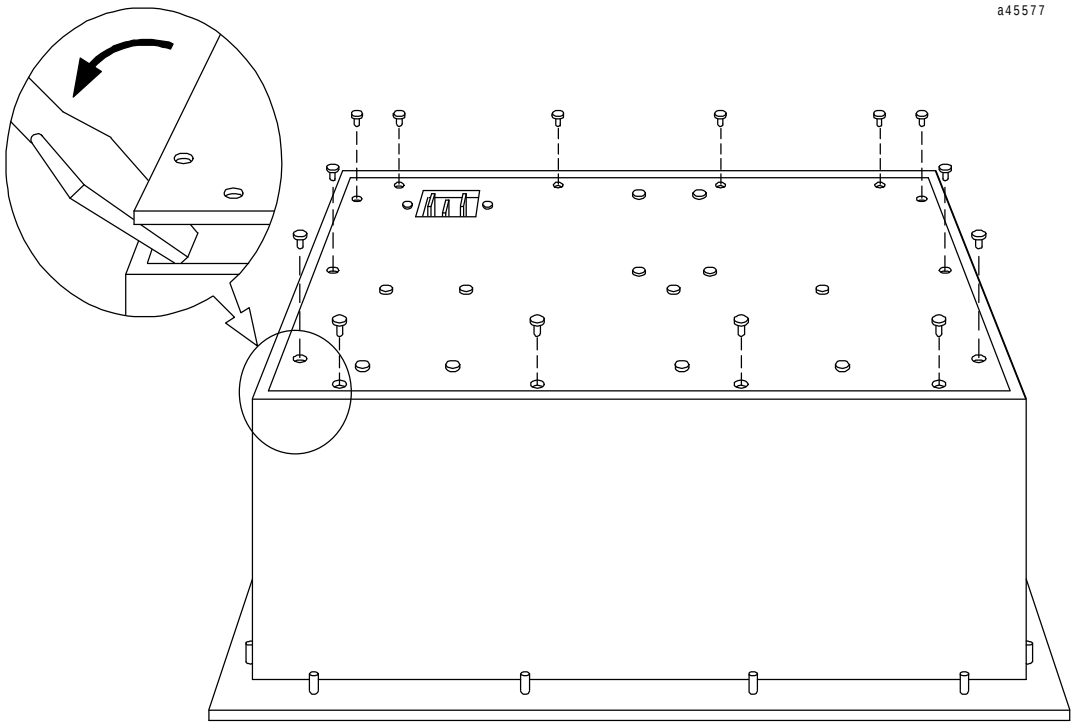
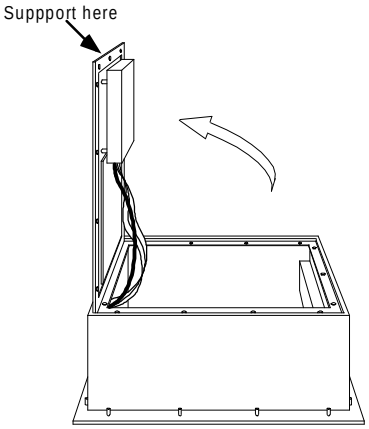


Figure 5-1. Opening the Display Station Rear Panel

   C. The floppy disk drive and other components mounted on the rear panel will have to clear the edge of the enclosure. Lift the panel slightly, shifting it away from the port connector side of the enclosure and then back toward the port connector side.

   D. Being careful not to place strain on the wiring, rotate the panel up and away from the port connector side, supporting it on the opposite edge of the enclosure. If cable lengths permit, lay the panel on the work surface next to the Display Station. Otherwise, have another person support the rear panel in a tilted position on the edge of the unit enclosure while you install (or remove) the upgrade.



Installing a Memory Upgrade

Specifications

Note

Memory installed in the CIMPLICITY Display Station products must meet the following specifications. **Slower memory will not work in the Display Station products.**

Type: 72-pin SIMM
Contacts: Tin-plated contacts
Access Time: 70ns or less

The following default BIOS settings are based on the use of memory with the above specifications:

Fast DRAM: Enabled
DRAM Timing Control: Fast

Note

Parity is disabled for the CIMPLICITY Display Station. Therefore, the Display Station will accept SIMMs that either have or do not have parity.

When you purchase additional product options to run on the Display Station, it is necessary to contact GE Fanuc to update the system licensing. Use one of the following numbers to reach GE Fanuc to update your registration:

Phone: 518-464-4619 Fax: 518-464-4581

You will need:

- original licenses you received with the Display Station product.
- license(s) provided with the upgrade products
- System Key Code generated during the registration procedure

For more information about completing your registration, refer to “Registering CIMPLICITY Software” in the CIMPLICITY Online Help or in the CIMPLICITY Base System User Manual, GFK-1180.

SIMM Installation Procedure

Caution

Electrostatic discharge is a major cause of electronic component failure. From the time the SIMM is removed from its antistatic bag to the time it is installed, extreme care should be taken to avoid damaging the SIMM or the Display Station with static electricity. A small, imperceptible electrostatic discharge could occur without your knowing and could be enough to damage electronic components.

To avoid damage from electrostatic discharge, adhere to the following precautions when performing this procedure:

- The SIMM is packaged in a static-safe bag which protects the product during shipping. Before removing the SIMM from this bag, be prepared to handle it in a static-safe environment.
- Wear a properly functioning antistatic strap and be sure that you are fully grounded. Never touch the SIMM, or any components inside the Display Station, unless you are wearing an antistatic strap.
- Any surface upon which you place the unprotected SIMM should be static-safe, facilitated by antistatic mats, if possible.
- Extra caution should be taken in cold, dry weather, when static charges can easily build up.

For 32MB Upgrades

Display settings: To run Windows 95 or Windows NT with more than 24MB of memory, the video display settings must be configured for 16 colors. All 32MB systems are shipped with the video display configured for 16 colors. If you are upgrading your system to 32MB, you must first change the display settings as follows:

1. From the Windows 95 Start menu, select Settings and then select Control Panel.
2. Click the Display icon.
3. Select the Settings tab.
4. Set the Color Palette to 16 colors and click OK.
5. When the system asks if you want to restart the computer, click No. Shut down the system using the Shutdown option on the Windows 95 Start menu or the Windows NT File menu.
6. Add the additional memory as described on page 5-6 and reboot.

To install the memory upgrade, complete the following procedure:

1. Open the Display Station enclosure (see “Opening the Rear Panel”).
2. Install the new memory board in the empty SIMM slot in the Display Station enclosure (see Figure 5-2 for location).
   A. Line up the key slots in the memory card with the matching points in the SIMM slot, as shown in Figure 5-3. (The SIMM’s chips should be facing away from the CPU and its pins should point down into the SIMM socket.)
   B. Slip the SIMM into the socket at a 45-degree angle and carefully press the bottom of the card into the connectors.
   C. Gently push the SIMM into a perpendicular position until the clips on the ends of the SIMM sockets snap into place.
   D. Check to ensure that the SIMM is correctly seated and that connector contacts touch. The SIMM should not move around in its socket.
3. Replace the rear panel on the unit enclosure and secure it using the screws that you removed in step 6.
4. Install the Display Station in its mounting location and connect the power, control and peripheral connections. (Refer to “Installation Procedure” in Chapter 2.)

At this point, you can power up the Display Station and begin operating with the new memory. No software configuration is required because the system automatically detects the added memory.

You can verify the memory installation by watching the powerup sequence. When you power up the Display Station, you will see the message XXXX KB OK, where XXXX is a number that increases until it matches the amount of usable memory. This number, which is displayed for a brief time, should include the memory that you just added.

If your system is running Windows 95, you can also see how much memory is installed in the Display Station as follows:

1. Click the Start button.
2. Click Settings.
3. Click Control Panel.
4. Double click the System icon. The System Properties window will be displayed. The amount of memory installed is listed under the heading, Computer.

Note

It is the customer’s responsibility to remove any upgrades from the Display Station before returning the unit to GE Fanuc for repair or warranty administration. We recommend that, next to the serial number on the rear panel of the Display Station, you place a label identifying installed upgrades.

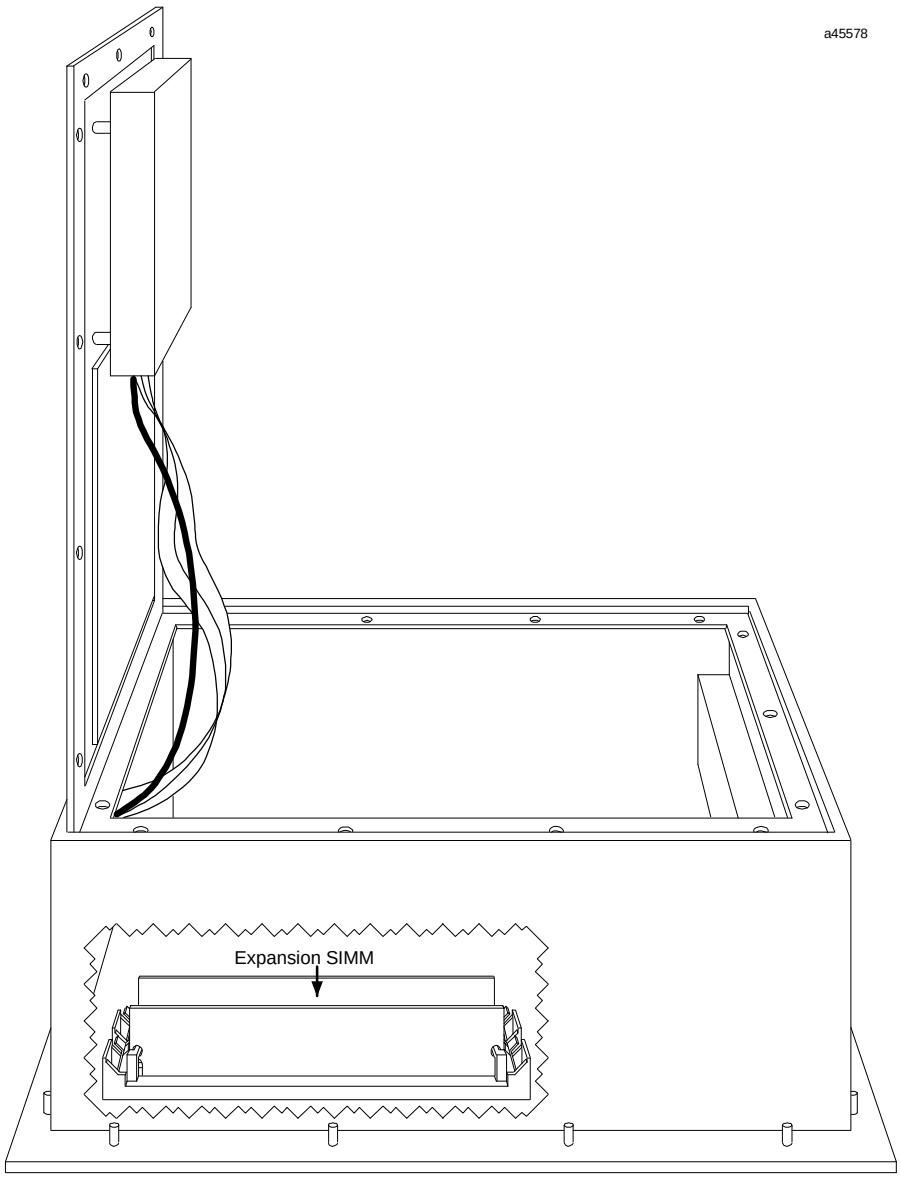


Figure 5-2. Location of SIMMs in Display Station Enclosure

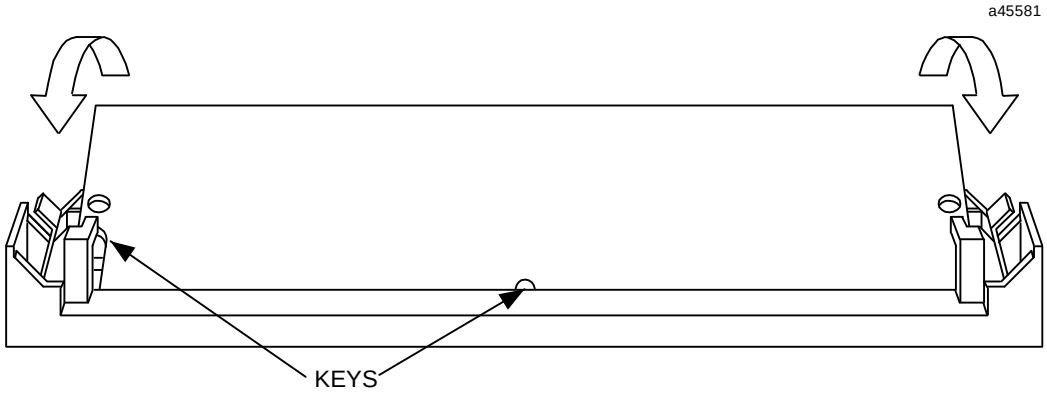


Figure 5-3. Detail of SIMM Installation

SIMM Removal Procedure

Caution

Electrostatic discharge is a major cause of electronic component failure. Extreme care should be taken to avoid damaging the SIMM or the Display Station with static electricity. A small, imperceptible electrostatic discharge could occur without your knowing and could be enough to damage electronic components.

To avoid damage from electrostatic discharge, adhere to the following precautions.

- Wear a properly functioning antistatic strap and be sure that you are fully grounded. Never touch the SIMM, or any components inside the Display Station, unless you are wearing an antistatic strap.
- Any surface upon which you place the unprotected SIMM should be static-safe, facilitated by antistatic mats, if possible.
- SIMM(s) should be placed in a static-safe bag after removal from the Display Station.
- Extra caution should be taken in cold, dry weather, when static charges can easily build up.

To remove the SIMM(s), complete the following procedure:

1. Shut down the Display Station, remove it from its mounting location, and open the rear panel. (See “Opening the Rear Panel” on page 5-2 for these procedures.)
2. Remove the SIMM(s) as follows:
   A. Press down on the clips at the ends of the SIMM sockets so that the SIMM is released.
   B. Lift the SIMM up slightly to disengage it from the connector contacts and then tilt the SIMM so that it’s key slots are disengaged from the SIMM socket keys.
   C. Gently remove the SIMM from the socket.

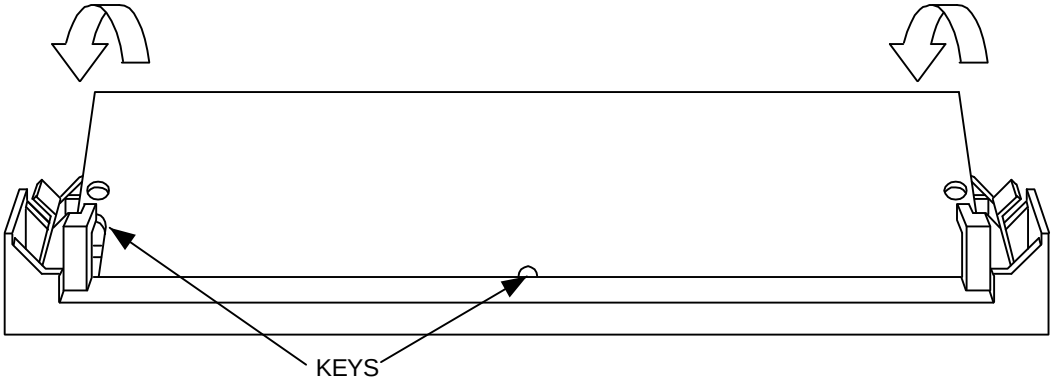


Figure 5-4. SIMM Removal

3. To protect the SIMM during handling and storage, place it in an antistatic bag.

Installing an ISA Board

Specifications

Maximum length: 9.75 inches (24.77cm)

Maximum power draw: 1.0A at +5V
0.64A at +12V
0.43A at -12V

Installation Procedure

Caution

Electrostatic discharge is a major cause of electronic component failure. The Display Station with static electricity. A small, imperceptible electrostatic discharge could occur without your knowing and could be enough to damage electronic components.

To avoid damage from electrostatic discharge, adhere to the following precautions when performing this procedure:

- Wear a properly functioning antistatic strap and be sure that you are fully grounded. Never touch any components inside the Display Station, unless you are wearing an antistatic strap.
- Extra caution should be taken in cold, dry weather, when static charges can easily build up.

Note

Refer to documentation provided by the manufacturer of your ISA-compatible board for additional cautions and procedures.

To install the ISA board, complete the following procedure:

1. Shut down the Display Station, remove it from its mounting location, and open the rear panel. (Refer to “Opening the Rear Panel” on page 5-2 for these procedures.)
2. Hold the ISA board by its bracket. The component side of the ISA board should be facing ***down***.
3. Carefully press the ISA board contacts into the ISA slot in the Display Station unit, as shown in Figure 5-5.
4. Press the bracket down until it engages the mounting screw on the ISA slot.
5. Tighten the mounting screw using a Phillips-head screwdriver.

6. If you require external access to ports on the ISA board:

   A. Remove the access plate from the Display Station enclosure. (The panel is secured by four Philips-head screws.)

   B. Modify the plate to accommodate cable connectors.

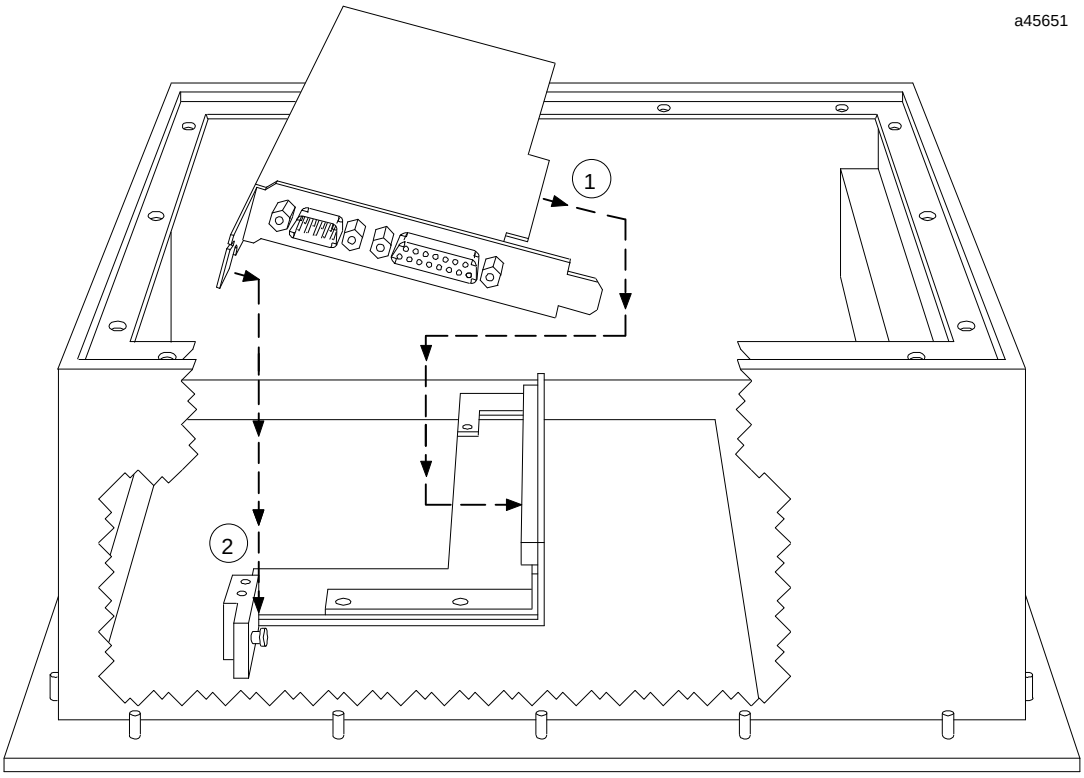
   C. Re-install the access plate in the Display Station enclosure.

7. Install the rear panel on the unit enclosure.

8. Install the Display Station in its mounting location and connect the power, control and peripheral connections. (Refer to “Installation Procedure” in Chapter 2.)

Note

It is the customer’s responsibility to remove any upgrades from the Display Station before returning the unit to GE Fanuc for repair or warranty administration. We recommend that, next to the serial number on the rear panel of the Display Station, you place a label identifying installed upgrades.



1 Press the ISA board contacts into the ISA slot.

2 Press the bracket down until it engages the mounting screw on the ISA slot.

Figure 5-5. ISA-Compatible Board Installation

Removal Procedure

Note

GE Fanuc recommends minimal insertion and removal of ISA boards because it puts strain on the connectors.

To remove the ISA board, complete the following procedure:

1. Shut down the Display Station, remove it from its mounting location, and open the rear panel. (Refer to "Opening the Rear Panel" on page 5-2 for these procedures.)
2. Using a Phillips-head screwdriver, loosen the mounting screw on the ISA slot mounting bracket.
3. Disengage the bracket of the ISA board from the mounting screw. (You might need to use your thumb and forefinger to press up on the board's mounting bracket while pressing down on the ISA slot bracket.)
4. Carefully pull the board out of the ISA slot.

Chapter 6 System Operation

This chapter presents details pertaining to the operation of specific Display Station features that are not covered in Chapter 2, “Getting Started.” The following topics are discussed in this chapter:

- External Keyboard Operation 6-2
- Setting Up External Display Operation 6-4
- Changing Video Display Settings 6-4
- Operating an External Mouse (Windows 95 Systems Only) 6-4
- Installing Printer Drivers 6-5

External Keyboard Operation

Most standard PS/2 keyboards with the appropriate DIN connector are compatible with Display Station systems. However, if you experience problems with an external keyboard, we recommend that you use one manufactured by KeyTronic®. These are commercially available through various outlets.

An external keyboard provides access to the entire ASCII key set and a better ergonomic layout for development work and for situations that require data entry.

On Display Station products that have a built-in keyboard, the built-in and external keyboards are wired together through a buffer that sends key code information to the controller.

Table 6-1 lists commonly used keyboard shortcuts that are available in Windows software. For a more complete listing of keyboard shortcuts, refer to the appropriate software documentation. Keyboard shortcuts are also listed on the pulldown menus in applications that provide them. (Pulldown menus can be accessed using the mouse or by pressing the **ALT** key plus the underlined letter in the menu title.)

Note

If you are using Windows 95, you can set the numeric keypad on an *external* keyboard to operate the mouse cursor. (This does not work with the internal keypad on Glide Station and Touch Station systems.) When you have completed this setup, the **4**, **8**, **6**, and **2** keys (← ↑ → ↓) will move the cursor and the **5** key will operate as the left mouse button. To set up your system for this type of operation, perform the following procedure:

1. Click the Start button.
2. Click the Control Panel icon.
3. Select the Settings option.
4. Double click the Accessibility Options icon.
5. Click the Mouse tab.
6. Click the Use MouseKeys check box.
7. Click the Settings... box to enable a keyboard shortcut, change pointer speed , etc. (The default setting enables this feature when **NUMLOCK** is on.)
8. Click OK twice.

Table 6-1. Selected Keyboard Shortcuts

In	To	Press
Windows (any Windows program)	See Help on a selected dialog box item	**F1**
	Allows you to change the name of the selected icon.	**F2**
	Brings up a Find window	**F3**
	Refreshes the screen	**F5**
	Toggles the screen	**F6**
	View the Task window	**CTL** + **ALT** + **DEL**
	Quit a program	**ALT** + **F4**, or **CTL** + **ALT** + **DEL** (from the Task window)
	View the shortcut menu for the selected item	**SHIFT** + **F10** (or click the right mouse button**)**
	Display the Start menu	**CTRL** + **ESC**
	Switch to the window you last used	**ALT** + **TAB**
	Switch to the next window	**ALT** while repeatedly pressing **TAB**
	Cut	**CTRL** + **X**
	Copy	**CTRL** + **C**
	Paste	**CTRL** + **V**
	Delete	**DEL**
	Undo	**CTRL** + **Z**
Windows 95 My Computer and Explorer	Select all	**CTRL** + **A**
	Refresh a window	**F5**
	View the folder one level up	**BACKSPACE**
	Close the selected folder and all its parent folders	**SHIFT** while clicking the Close button
	Switch between left and right panes	**F6**
Windows 95 Explorer only	Go to	**CTRL** + **G**
	Expand current selection if it's collapsed	**RIGHT ARROW**
	Collapse current selection if it's expanded	**LEFT ARROW**
DOS box	Toggle the printer on and off	**CTRL + P**
	Backspace	**CTRL + H**
During Startup	Bring up the Setup utility	**F8** while booting
	Bypass CONFIG.SYS and AUTOEXEC.BAT and go directly to the DOS prompt.	**F13 (CTRL + F3)**
	Select line-by-line query of the boot files	**F16 (CTRL + F8)**

Setting Up External Display Operation

Note

The Display Station system does not support simultaneous use of the Flat Panel display and an external CRT monitor. Only one display can be active at a time.

Two executable files (CRT.COM and STN.COM) that allow you to switch between the internal Flat Panel display and an external CRT monitor are provided in the GEFUTIL folder on the hard disk and on the Utilities disk that is provided with the Display Station. To switch to the external monitor, you must run the CRT executable program. To switch back to the internal video screen, you must run the STN executable program. If power is cycled, the Display Station will power up with the internal screen active.

To run CRT.PIF or STN.PIF:

1. Using My Computer or Explorer, open the C:\GEFutil folder.
2. Double click the CRT or STN file.

Changing Video Display Settings

Display Station products are shipped with the video display settings configured for 16 colors. If your Display Station has 24MB or less memory, you can use the 256-color setting. To change the display settings:

1. Click on the Display icon in the Control Panel.
2. Select the Settings tab.
3. Set the Color Palette to 256 colors and click OK.
4. When the system asks if you want to restart the computer, click No. Then shut down the system using the Shutdown option on the Start Menu.

Note

If your Display Station has 32 MB memory, you ***must*** use the 16-color display setting.

For information on installing memory upgrades, refer to Chapter 5.

Operating an External Mouse (Windows 95 Systems Only)

On Display Station systems that run Windows 95 software, the COM1 port is set up to be compatible with a Logitech™ serial mouse. To use an external mouse, the Display Station must be powered up or restarted with the mouse connected to the COM1 port. During bootup, the software will automatically detect the presence of the external mouse.

(To restart the computer, select Shutdown from the Windows Start menu, then select the option, Restart the Computer.)

Installing Printer Drivers

Windows 95 systems: To install printer drivers, double click on the My Computer icon on the Windows 95 desktop. Double click on the Printers icon in the My Computer window.

Double click on the Add Printer icon in the Printers window. The Add Printer Wizard screen will appear. Follow the prompts provided by the Wizard screens to finish installing the printer driver for your printer.

Windows NT systems: To install printer drivers, double click on the Print Manager icon in the Main program group.

1. From the Window menu, select the printer.
2. From the Printer menu, select Properties.
3. In the Printer Properties dialog box, select Other in the Driver box.
4. In the Install Driver dialog box, specify the drive and path where the printer driver is located and click the OK button.

For more information about installing printer drivers, refer to the “printer drivers, installing” topic in Windows NT online help.

Chapter 7 SNP Device Communications

The Series 90 device communications enabler uses the Series Ninety Protocol (SNP) to communicate with Series 90 programmable controllers over a serial line. Standard serial communication ports are used to communicate between a Series 90 programmable controller and CIMPLICITY software.

SNP is a half-duplex protocol that uses the RS-485 (enhanced version of RS-422) and RS-232 electrical interfaces. The protocol permits communication between one master and one or more slaves. Communication between CIMPLICITY software and Series 90 controllers can be set up as a point-to-point connection or in a multidrop configuration, using Serial Port 2 configured for RS-422. Connections can be established on the RS-485 CPU port of the Series 90 programmable controller, or via a Communications Coprocessor Module (CMM) card.

The following topics are presented in this chapter:

- Overview 7-2
- Hardware Installation 7-3
- Application Configuration 7-6
- SNP Performance Notes 7-10

Overview

Supported Devices

The SNP device communications enabler supports reading and writing point data to the following Series 90 controllers:

S90-20 Model 211	S90-70 Model 731
S90-30 Model 311	S90-70 Model 732
S90-30 Model 313	S90-70 Model 771
S90-30 Model 321	S90-70 Model 772
S90-30 Model 323	S90-70 Model 781
S90-30 Model 331	S90-70 Model 782
S90-30 Model 341	S90-70 Model 914
	S90-70 Model 924

Supported Memory Types

Data may be read from the following memory types:

%AI	Analog Inputs
%AQ	Analog Outputs
%G	Genius Global Data
%I	Discrete Inputs
%M	Discrete Internals
%Q	Discrete Outputs
%R	Registers
%S	Discretes
%SA	Discretes
%SB	Discretes
%SC	Discretes
%T	Discrete Temporaries

Data may be written to the following memory types:

%AI	Analog Inputs
%AQ	Analog Outputs
%G	Genius Global Data
%I	Discrete Inputs
%M	Discrete Internals
%Q	Discrete Outputs
%R	Registers
%T	Discrete Temporaries

Caution

Do not write data into the system registers (%S, %SA, %SB, %SC). Doing so may interfere with the normal operation of the programmable controller.

SNP Hardware Configuration Requirements

Original CMM cards did not support the SNP protocol. The following versions (or later) of software/hardware are needed to use this feature. Other modules in the Series 90 CPU rack may need to be upgraded when upgrading the CPU firmware.

Series 90-30

The versions for Series 90-30 are:

CPU	IC693CPU331K	V3.03 or higher firmware.
	IC693CPU341	Version 4.02 or higher firmware.

Note

331 and 341, and 351 CPUs are the only members of the 90-30 family that support a CMM card.

CMM	IC693CMM311D	

Version 3.50 or higher version of Logicmaster 90-30 Software Package Programmer and Configurator. This is optional if a Hand-Held Programmer for Series 90-30 and 90-20 Programmable Controllers is available. The Hand-Held Programmer may be used to configure the CMM.

IC641SWP301L	3.5I 2DD, 5.25I 2S/HD (WSI Version)
IC641SWP304J	5.25I 2S/2D (WSI Version)
IC641SWP306F	3.5I 2DD, 5.25I 2S/HD Standard Serial COM port
IC641SWP307F	5.25I 2S/2D Standard Serial COM port

Series 90-70

All CPU modules require V4.02 or higher firmware.

CPU	IC697CPU731N	Series 90-70 Model 731
	IC697CPU732C	Series 90-70 Model 732
	IC697CPU771L	Series 90-70 Model 771
	IC697CPU772C	Series 90-70 Model 772
	IC697CPU781D	Series 90-70 Model 781
	IC697CPU782D	Series 90-70 Model 782
	IC697CPM914	Series 90-70 Model 914
	IC697CPM924	Series 90-70 Model 924
CMM	IC697CMM711E	PCMA2 H/W only
	IC697CMM711EX	PCMA1 H/W only

Version 4.01 or higher of the Logicmaster 90-70 Software Package Programmer and Configurator is required to configure a CMM card.

IC641SWP701L	3.5I 2DD, 5.25I 2S/HD (WSI Version)
IC641SWP704J	5.25I 2S/2D (WSI Version)
IC641SWP706B	3.5I 2DD, 5.25I 2S/HD Standard Serial COM port

Required Documents

You should have one or more of the following documents available when configuring your SNP communications network:

Series 90-20 Programmable Controller User's Manual (GFK-0501).

Series 90-30 Programmable Controller Installation Operator's and User's Manual (GFK-0356).

Series 90-70 Programmable Controller Installation Manual (GFK-0262).

If you are using a CMM card, you should also have the following manual available:

Series 90 PLC Serial Communications User's Manual (GFK-0582).

Hardware Installation

The CIMPLICITY SNP Device Communications enabler supports point-to-point configurations of Series 90 controllers.

When you configure the SNP port, you will need to know the baud rate and parity being used by the Series 90 programmable controllers. Also, CIMPLICITY software uses 8-bit characters with 1 stop bit for communicating with Series 90s.

If a CMM card is used, it may be desirable to configure an SNP ID different from that of the attached port. The *Series 90 PLC Serial Communications User's Manual* (GFK-0582) describes the ladder logic required to change the SNP ID. If this is done, be ***sure*** that the Series 90 is in a RUN state, and the SNPIO ladder logic has successfully completed before attempting to communicate with the device via CIMPLICITY software or device communications will fail.

In general, a baud rate of 9600 or less is recommended. If both ports on the CMM module are in use, the baud rate ***must*** be 9600 or less.

Caution

Serial ports on the Series 90 programmable controllers and on the CIMPLICITY Display Station are *not* isolated. Potential differences above 7 volts will cause damage. Isolators should be employed on long distance runs to guard against equipment damage.

Refer to Appendix A for cable and connector information. Also refer to the cable diagrams in the manual for your programmable controller communication module.

Application Configuration

When you are configuring ports, devices, and device points, you will be asked for some information that is specific to SNP device communications. Refer to the *CIMPLICITY for Windows Base System User's Manual* (GFK-1180) for details of configuring ports, default properties, and devices in a CIMPLICITY project.

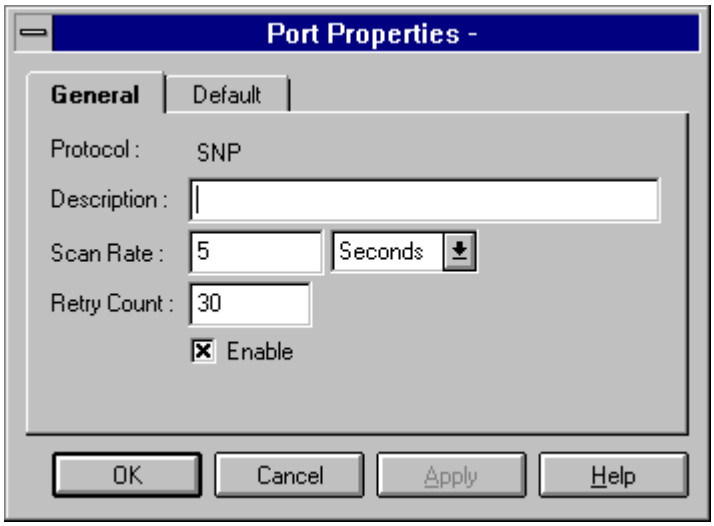
Port Configuration

When you create a new port for SNP device communications, enter the following information in the New Port dialog box:

1. In the Protocol field, select "SNP" from the list of protocols available.
2. In the Port field, select the communication port (COM1 or COM2) that will be used for SNP communications.

   When you click Enter to create the port, the Port Properties dialog box for the protocol will be displayed.

General Properties



Use the General properties tab to enter general information for the port. You can define the following:

Description Enter an optional description to help you identify the port.

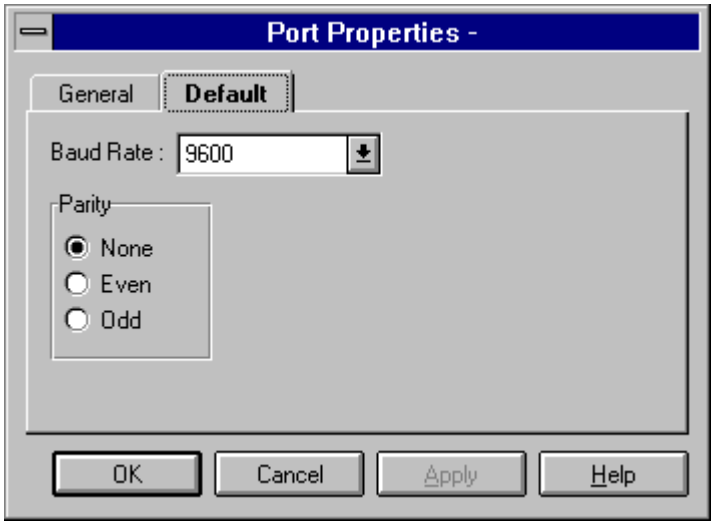
Scan Rate Enter the base scan rate for the port. Point scan rates will be in multiples of the base rate. You can specify a scan rate in Ticks, Seconds, Minutes, or Hours.

Retry Count If communications cannot be established to a device on the port, the device is considered to be down and a $DEVICE_DOWN alarm is generated. Once a device is down, periodic attempts are made to resume connections to it.

Enter the number of scans to wait before attempting to reconnect to a device after a communications error has been detected.

Enable Click an "X" in this box if you want the port to be enabled when the project starts. If you leave this box blank, the port will not be enabled when the project starts, and points will not be available for devices on the port.

Default Properties



Use the Default properties tab to enter information about the SNP communications for the port. You can define the following:

Baud Rate Enter the baud rate for communications. Click the drop-down list to the right of the input field and select a rate from the list.

Parity Select the parity for communications.

Note

Make sure the baud rate and parity you select match those on the Series 90. Series 90s are normally shipped with the RS-485 and CMM ports configured for a baud rate of 19.2 Kbaud, and odd parity.

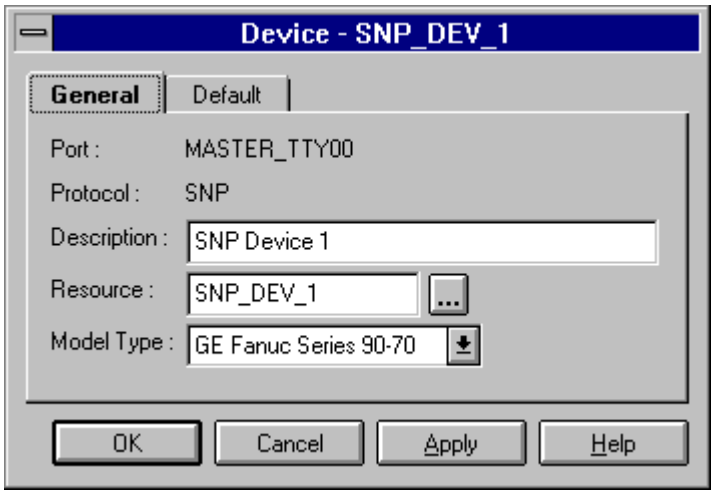
SNP Device Configuration

When you create a new device for SNP device communications, enter the following information in the New Device dialog box:

1. In the Device field, enter the name of the device you are configuring.
2. In the Port field, select the SNP port to be used by the device.

   When you click Enter to create the port, the Device Properties dialog box will be displayed.

General Properties



Use the General properties tab to enter general information for the device. You can define the following:

Description Enter an optional description to help you identify the device.

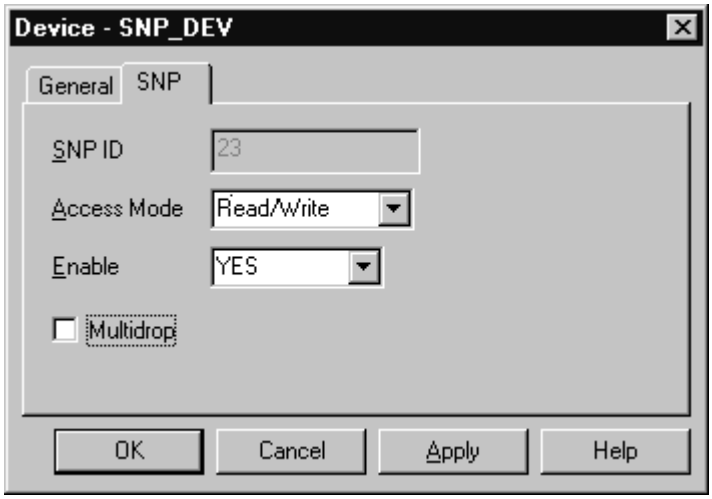
Resource Enter a resource that can be associated with this device for alarm generation.

Model Type Select the type of device. Click the drop-down button to the right of the input field to display your choices, then make a selection. For this protocol, the choices are:

GE Fanuc Series 90-30

GE Fanuc Series 90-70

Default Properties



Use the *Default* properties to enter information about SNP device communications for the device. You can define the following:

SNP ID	For multidrop communications: Click an "X" in the Multidrop check box. Enter the ID of the programmable controller in SNP ID.
Access Mode	For point-to-point communications: Clear the Multidrop check box. Select Read or Read/Write in Access Mode.
Enable	For all communications: Select Yes in this box to enable the device when the project starts. Select No to disable the device. The points associated with the device will be unavailable.

SNP Point Configuration

When you define a point, the following fields have values that are unique to or have special meanings for SNP device communications:

Access	A point may be configured for READ or WRITE access.
Update Criteria	The update criteria determines how the data will be requested. Enter ON_CHANGE or ON_SCAN for points whose value should be polled by the SNP driver at regular intervals.
Address	Point address requirements are device-dependent. For SNP device communications, the address format is <memory_type><offset>.

When you are configuring DIGITAL points, you must also enter data in the following fields:

Address Offset	Enter the bit offset that corresponds to the bit position within the word.

SNP Performance Notes

Impact on Series 90 Performance

When the attached port of a Series 90 is being used to support serial communications, a maximum of 5 milliseconds will be added to the scan on the controller. This should be taken into account in any application.

Performance Using the SNP Communications Enabler

The CIMPLICITY SNP communications enabler is a serial communications enabler which supports access to most memory types in a Series 90 controller. The amount of data that can be transferred between CIMPLICITY software and the Series 90 controller will be limited by the baud rate and some protocol level tunables (discussed in the next section).

In addition, when communicating to multiple Series 90 controllers in a multidrop configuration, certain transactions between the CIMPLICITY software and the Series 90 controller must occur each time communication is switched to a different Series 90 controller. These transactions occupy a significant amount of time (typically 0.4 to 1 seconds). When designing the CIMPLICITY system, the throughput via SNP should be taken into account.

Tuning SNP Protocol Throughput

The protocol supports the ability to tune certain protocol level parameters which significantly impact performance. These parameters, along with the baud rate, are dominant factors in polling throughput.

SNP Data Size

One parameter controls the amount of data that can be sent between the host and the Series 90 controller. For CIMPLICITY based systems, CIMPLICITY software will attempt to negotiate a data size of 4000 bytes. This value was selected in order to optimize the I/O performance within CIMPLICITY software's host computer. If a lower value is configured on the Series 90 controller, the lower value will be used.

Time Between SNP Messages

The parameter controls the time between SNP messages. By default, CIMPLICITY software will attempt to negotiate a value of 5 milliseconds. A higher value may be configured by defining a logical entity named BSM$SNP_T1_TIME.

The logical is defined by adding a line to the project's DATA\LOG_NAMES.CFG file. The line should be in the following format:

BSM$SNP_T1_TIME|S|default|3|<time>

where **<time>** is the desired time in milliseconds between messages.

If the logical is created, or the value for the logical is modified, CIMPLICITY software must be stopped and restarted before the new value will take effect.

As with the data size parameter, the time between SNP messages is a negotiated value. A higher value on the Series 90 controller will result in the higher value being used.

SNP Special Notes

In earlier versions of the Series 90 controller, the protocol limited the number of retries to three. If the CPU firmware on the Series 90 controller is earlier than V3.03 for the Series 90-30 or V4.02 for the Series 90-70, or when using a Series 90-20, be sure to configure the retry count on the port to a value of 3 or less.

Logging Controller Information

When the CIMPLICITY system first establishes communication with a Series 90 programmable controller, it will print out the controller's model, SNP timer values, the internal data transfer size and the number of elements for each memory type available in CIMPLICITY software. This information will appear in the <PORT>.OUT file in the project's LOG directory, where <PORT> is the name of the port configured for SNP communications. For example, if SNP is configured to run on COM1, the output file will be COM1.OUT.

Enabling Protocol Level Debugging

In addition to this information, the SNP communications enabler supports the ability to dynamically enable/disable the logging of protocol level errors as they occur. This information is logged in the Status Log file. By default, the logging of protocol level errors is disabled. When difficulties are encountered in communicating with a device, it may be useful to enable the protocol level debugging. This may be done by creating the <PORT>.DEBUG file in the project's LOG directory, where <PORT> is the name of the port configured for SNP communications.

To create the file, select Command Prompt... from your project's Tools menu, then type the following commands:

```
cd .\log
copy nul <PORT>.debug
```

where **<PORT>** is the name of the port configured for SNP communications. For example, if SNP is configured to run on COM1, the file name will be COM1.DEBUG.

The debugging will begin immediately; you do not need to restart CIMPLICITY software.

Disabling Protocol Level Debugging

To turn off the logging of protocol level information, remove the COM1.DEBUG file from the project's \LOG directory. To remove the file, select Command Prompt... from your project's Tools menu, then type the following commands to create the file:

```
cd .\log
del <PORT>.debug
```

where **<PORT>** is the name of the port configured for SNP communications.

Chapter 8 TCP/IP Communications

The Series 90 TCP/IP Device Communications enabler supports TCP/IP communication over Ethernet to Series 90-70 and Series 90-30 programmable controllers. This device communication enabler employs the Series 90 Host Communication Toolkit (HCT) as its underlying communication layer.

The following topics are covered in this chapter:

- Overview 8-2
- Installation Verification Procedures 8-4
- Application Configuration 8-10

Note

A standard PS/2-type keyboard is *required* for configuration of TCP/IP parameters. Use of a keyboard is also recommended with the HCT diagnostic program.

Overview

Supported Devices

The Series 90 TCP/IP Device Communications enabler supports the following devices:

- GE Fanuc Series 90-70 programmable controllers
- GE Fanuc Series 90-30 programmable controllers

Supported Memory Types

The Series 90 TCP/IP Device Communications enabler supports reading and writing point data to the Series 90-70 and Series 90-30 controllers.

Data may be read from the following memory types:

Memory Type	Description	Memory Type	Description
%AI	Analog Input Table	%Q	Discrete Output Table
%AQ	Analog Output Table	%R	Register Memory
%G	Genius Seamless	%S	System Fault Table
%I	Discrete Input Table	%SA	Special Contacts A
%L	Local Memory *	%SB	Special Contacts B
%M	Discrete Internal	%SC	Special Contacts C
		%T	Discrete Temporary

* %L may only be used on Series 90-70

Caution

Do not write data to the system registers (%S, %SA, %SB, and %SC). Doing so may interfere with the normal operation of the programmable controller.

Data may be written to the following memory types:

Memory Type	Description	Memory Type	Description
%AI	Analog Input Table	%M	Discrete Internal
%AQ	Analog Output Table	%Q	Discrete Output Table
%G	Genius Seamless	%R	Register Table
%I	Discrete Input Table	%T	Discrete Temporary
%L	Local Memory *		

* %L may only be used on Series 90-70

Hardware Configuration Requirements

Target Series 90-70 programmable controllers require the following:

- A TCP/IP Ethernet communications module (IC697CMM741H, PROM version 1.12 or later).
- Supporting LAN software (IC651ENS042, containing GSM version 2.09 or later, TCP executive 1.28 or later, and TCP/IP configuration editor 1.02 or later)
- CPU firmware must be release 4.12 or later

Target Series 90-30 programmable controllers require the following:

- A TCP/IP Ethernet communications module (IC697CMM321).
- CPU firmware must be release 5.0 or later

If you are using Logicmaster 90 software:

- Logicmaster 90 version 4.0 or later must be used with Series 90-70 programmable controllers.
- Logicmaster 90 version 6.0 or later must be used with Series 90-30 programmable controllers.

Caution

Do not use the Series 90 TCP/IP Communications Interface with a Series 90-70 programmable controller using C-blocks in the ladder *unless* the programmable controller CPU has been upgraded to version 6.0 firmware. The programmable controller may crash otherwise.

Related Documents

You should have the following document available when configuring your communications network:

Series 90-70 Programmable Controller Installation Manual (GFK-0262)

If you are using an Ethernet Module, you should also have the following manual available:

TCP/IP Ethernet Communications for the Series 90-70 PLC (GFK-1004)

Installation Verification Procedures

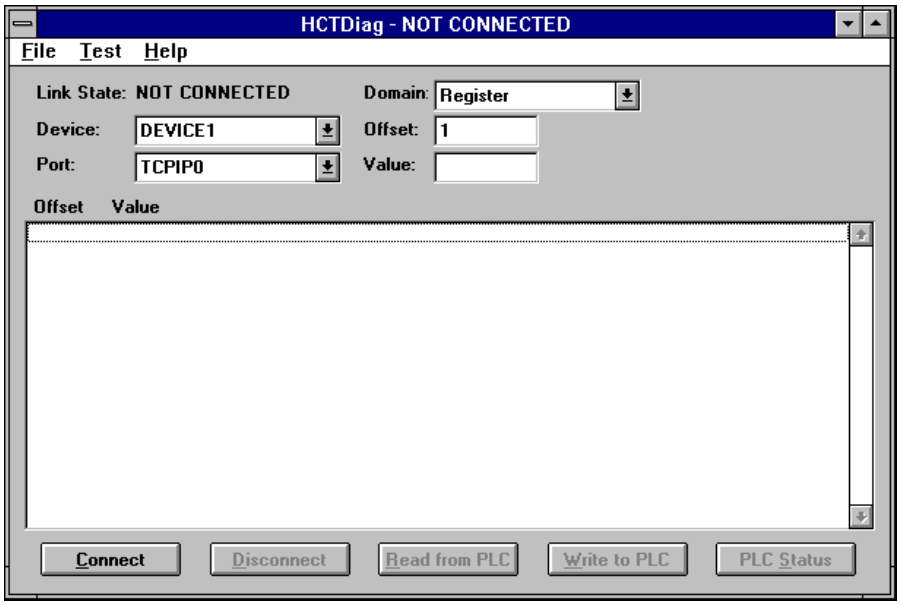
The Series 90 Diagnostic Program (HCTDIAG.EX) is a program provided with the Series 90 TCP/IP device communication enabler that you can use to check the basic operation and configuration of your network without starting CIMPLICITY software. You can perform the following functions:

- Live update of the currently displayed domain
- Read load test
- Write load test

For this program to function, CIMPLICITY software's Series 90 TCP/IP device communications enabler must be successfully installed, and you must have configured the TCP/IP port and Series 90 devices using CIMPLICITY application configuration functions.

To start the diagnostic program, click the Series 90 Diagnostics icon in the CIMPLICITY Configuration cabinet.

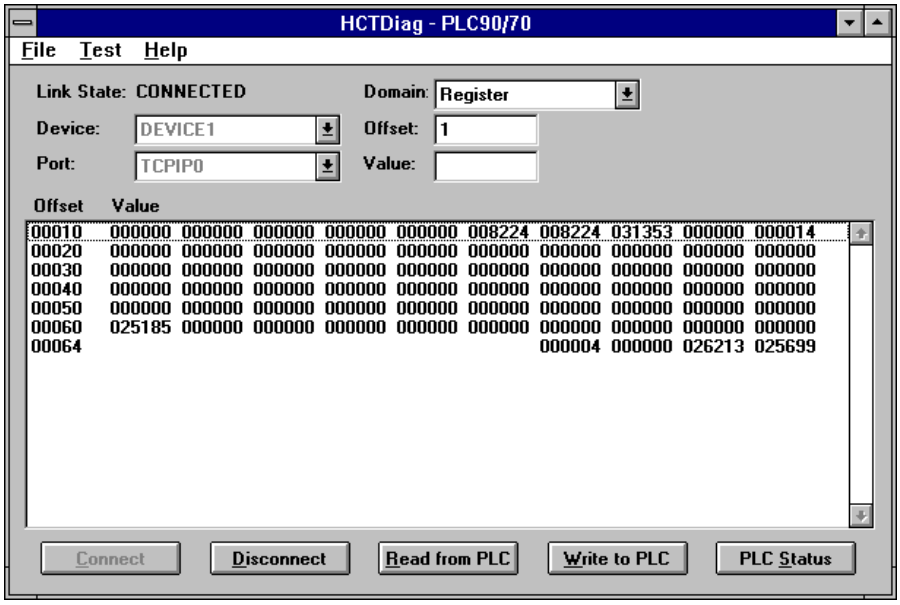
The HCTDiag window will be displayed



To connect to a Series 90 programmable controller in the TCP/IP network:

1. Click the drop-down list button to the right of the Device input field to display the list of currently configured devices, and select a Series 90 device from the list.
2. Click the drop-down list button to the right of the Port input field to display the list of currently configured ports, and select the TCP/IP port to use.
3. Click the drop-down list button to the right of the Domain input field to display the list of currently supported domains (memory types), and select a domain to display.
4. Click the Connect button.

The program will make the connection with the programmable controller, and display the values contained in the requested domain.



To display the data for another domain, just select the domain from the drop-down list in the Domain input field. The data for the new domain will automatically be read and displayed in the data box.

You can use the menus and pushbuttons to do the following:

- Toggle between manual and automatic data update modes.
- Request manual reads of domain data
- Request writes to the programmable controller
- Display programmable controller status
- Perform a read load test
- Perform a write load test

Toggling Between Data Update Modes

Normally, domain data is only read when the domain display is initiated or when you click on the Read from PLC or Write to PLC buttons. You can have data updated automatically by doing the following:

1. Click the File menu.
2. Select Live Update from the submenu.

When Live Update is enabled, the domain values will be read and updated automatically approximately every three seconds.

To return to manual mode:

1. Click the File menu. Note that Live Update has a check mark next to it.
2. Select Live Update again to turn off the Live Update mode.

Requesting Manual Reads of Domain Data

If you are not in Live Update mode, you can manually request reads of the domain by clicking the Read from PLC button.

Writing Test Data to the Programmable Controller

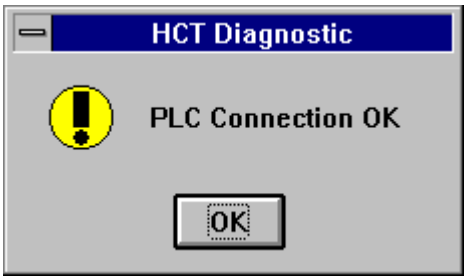
You can use this window to write test data to the Series 90 programmable controller.

1. Select the domain to write to. Note that if you select a domain that is read-only, the Write to PLC button will be disabled (grayed out).
2. Enter the memory location offset that you want to write to in the Offset input field.
3. Enter the value you want to write in the Value input field.
4. Click the Write to PLC button.

The value will be written to the offset location, and the data display box will be updated to reflect your write request.

Checking Programmable Controller Status

Click the PLC Status button to display the current status of the programmable controller. An HCT Diagnostic dialog box like this will be displayed:



Click OK to close the dialog box

Performing a Read Load Test

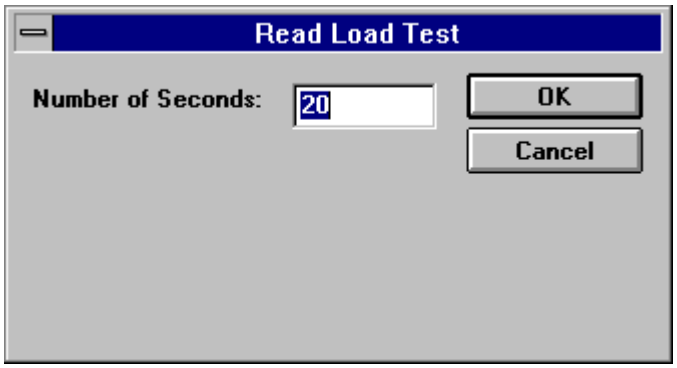
You can use HCTDIAG.EXE to perform read load tests on your network. The read load test is performed in two parts:

- The first part tests the number of words per second that can be read over the network
- The second part tests the number of read requests per second that can be made over the network.

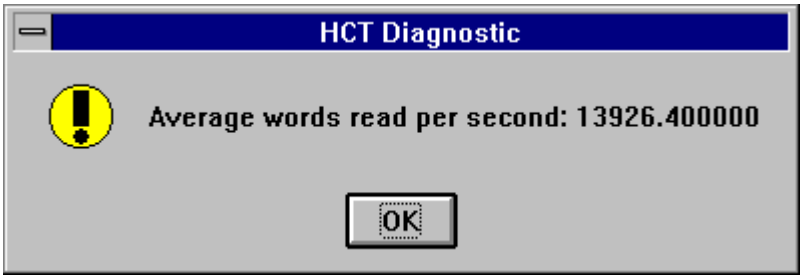
The test reads data from all domains on the currently selected programmable controller.

To perform a read load test:

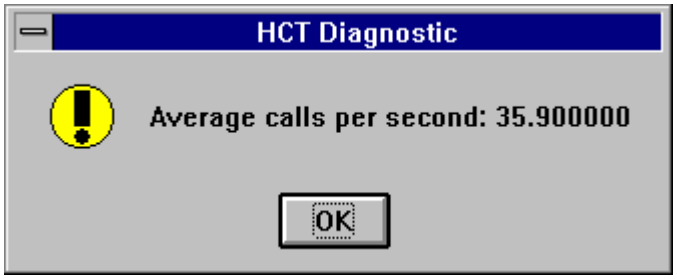
1. Click the Test menu.
2. Select Read Load Test... from the submenu. The Read Load Test dialog box will open.



3. Enter the number of seconds you want to run the test in the Number of Seconds input field, and click on OK to start the test. The test will cycle through reads of all memory types on the current device for the number of seconds you specify. At the end of the time period, an HCT Diagnostic dialog box is displayed, telling you the average number of words read per second over the test period.



4. Click OK to proceed to the second part of the read test. The test will again cycle through reads of all memory types on the current device for the number of seconds you specified on the Read Load Test screen. At the end of the time period, an HCT Diagnostic dialog box is displayed, telling you the average number of read requests made per second over the test period.



5. Click OK to terminate the test.

Performing a Write Load Test

Warning

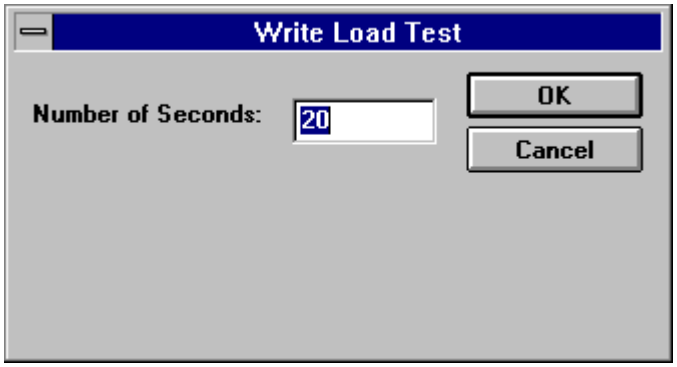
This test will overwrite the contents of the register domain (%R). Do not run this test if the register domain of the programmable controller contains important information.

You can use HCTDIAG.EXE to perform write load tests on your network. The write load test tests the number of words per second that can be written over the network.

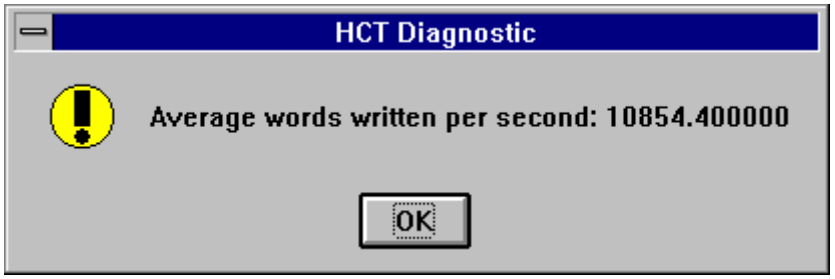
The test writes data to the register domain (%R) on the currently selected programmable controller.

To perform a write load test:

1. Click the Test menu.
2. Select Write Load Test... from the submenu. The Write Load Test dialog box will open.



3. Enter the number of seconds you want to run the test in the Number of Seconds input field, and click on OK to start the test. The test will cycle through writes of register memory on the current device for the number of seconds you specify. At the end of the time period, an HCT Diagnostic dialog box is displayed, telling you the average number of words read per second over the test period.



4. Click OK to terminate the test.

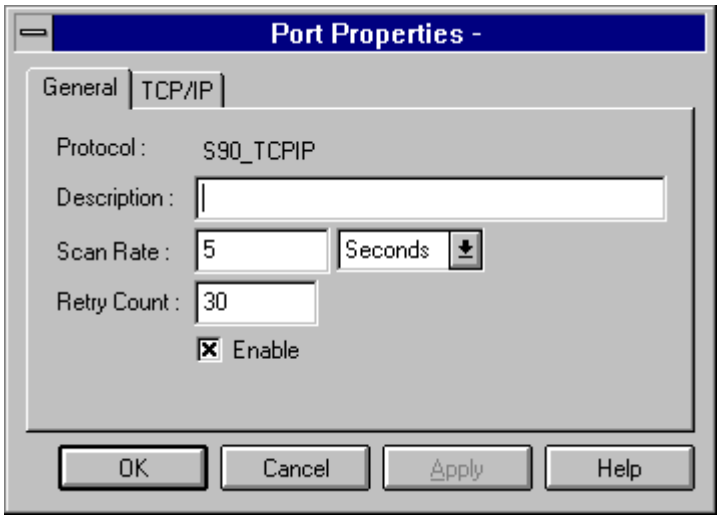
Application Configuration

When you are configuring ports, devices, and device points, you will be asked for information that is specific to Series 90 TCP/IP device communications. Refer to the *CIMPLICITY for Windows Base System User's Manual* (GFK-1180) for details of configuring ports, default properties, and devices in a CIMPLICITY project.

Port Configuration

When you configure a port for Series 90 TCP/IP device communications, the Port Properties screen for the protocol will be displayed.

General Properties



Use the General properties tab to enter general information for the port. You can define the following:

Description Enter an optional description to help you identify the port.

Scan Rate Enter the base scan rate for the port. Point scan rates will be multiples of the base rate. You can specify a scan rate in Ticks (100 ticks = 1 second), Seconds, Minutes, or Hours.

Retry Count Enter the number of scans to wait before attempting to reconnect to a device on this port after a communications error is detected.

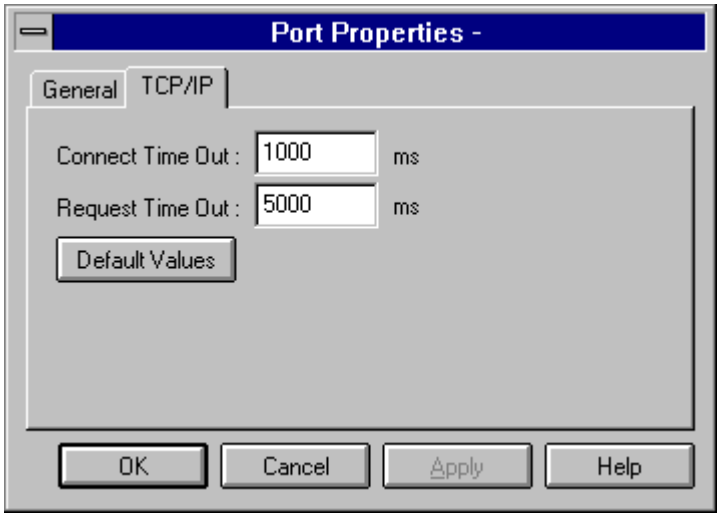
If communications cannot be established by a device on this port, the device is considered to be down and a $DEVICE_DOWN alarm is generated. Once a device is down, periodic attempts are made to resume connections to it.

Enable Click an "X" in this box if you want the port to be enabled when the project starts. If you leave this box blank, the port will not be enabled when the project starts, and points will not be available for devices on the port.

TCP/IP Properties

Note

The Display Station is configured with TCP/IP communications enabled and the IP address set to 1.1.1.1. If you are using TCP/IP, you should modify this address for your network configuration. If you place multiple Display Stations on a network without modifying this address, a “Conflicting Address” warning message will be displayed at startup.



Use the TCP/IP properties tab to enter information about TCP/IP communications for the port. You can define the following:

Connect Time Out Enter the number of milliseconds to wait when making a connect request to a device.

Request Time Out Enter the number of milliseconds to wait when waiting for a request to complete.

Note

Connect Time Out and **Request Time Out** values apply to all Series 90 TCP/IP ports in your project.

You can enter your own values or click Default Values to use the factory default values. The default values are:

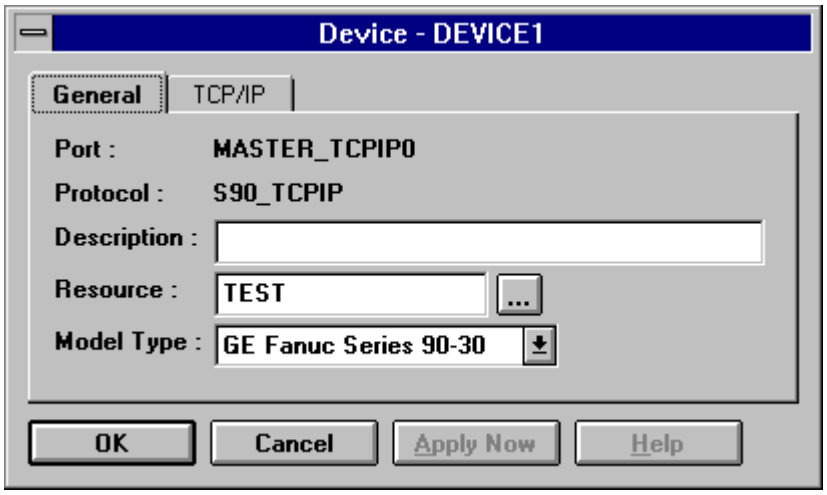
Connect Time Out 10000 ms (10 seconds)

Request Time Out 5000 ms (5 seconds)

Device Configuration

When you configure a Series 90 for TCP/IP device communications, the Device Properties screen for devices using this protocol will be displayed.

General Properties



Use the General properties tab to enter general information for the device. You can define the following:

Description Enter an optional description to help you identify the device.

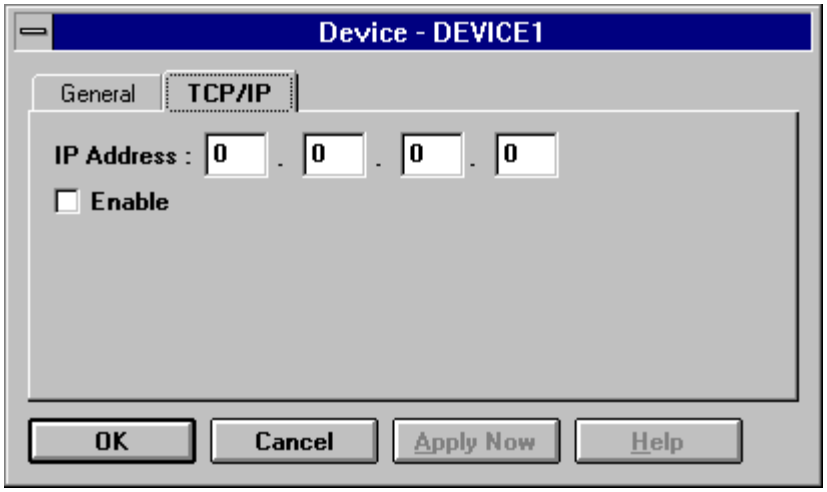
Resource Enter a resource that can be associated with this device for alarm generation.

Model Type Select the type of device. Click the drop-down button to the right of the input field to display your choices, then make a selection. For this protocol, the choices are:

GE Fanuc Series 90-70

GE Fanuc Series 90-30

TCP/IP Properties



Use the TCP/IP properties tab to enter information about TCP/IP communications for the device. You can define the following:

IP Address Enter the IP address of the Ethernet card on the Series 90 device in these four fields.

Enable Click an "X" in this box to enable the device when the project starts. If you leave this box blank, the device will not be enabled and points associated with the device will be unavailable.

Device Point Configuration

For all memory types except %L, enter the memory type and offset in the **Address** field. The address format is:

<memory type><address>

For example, to specify Register 1, the address is %R1. All offsets have a minimum value of 1.

The address of %L memory types requires the block name. Block names *must* be unique over all programs in the programmable controller. Block names cannot begin with a numeric character. The address format is:

%L<address><block name>

For example, to specify the fifth word in the %L domain in the program block ABC, the address is %L5ABC.

Chapter 9

MODBUS RTU Device Communications

The MODBUS RTU protocol supports a multidrop configuration with one master. In this application, the CIMPLICITY MODBUS RTU Device Communications Enabler functions as the master. A CIMPLICITY device must be configured for each physical device (or slave) from which data will be collected.

This chapter provides installation and configuration information for the MODBUS RTU Communications Enabler. The following topics are presented:

- Overview 9-2
- Hardware Installation 9-4
- Validating Communications 9-6
- Application Configuration 9-7
- Device Configuration 9-8
- Point Configuration 9-10

Overview

Supported Devices

The MODBUS RTU Communications Enabler supports communications to the following programmable controllers:

- GE Fanuc Series Six PLC with CCM3 card (Version 1.06 or later)
- Modicon 484
- Modicon 584
- Modicon 584
- Modicon 884
- Modicon 984
- Modicon Micro 80

Memory Types

The MODBUS RTU Communications Enabler supports the following memory types on GE Fanuc Series Six and Modicon programmable controllers:

Series Six

Reads from the following memory types on Series Six with CCM3 in RTU mode:

Output Table	0xxx(x)
Input Table	1xxx(x)
Registers	3xxx(x) or 4xxx(x)

Writes to the following memory types on Series Six programmable controllers with CCM3 in RTU mode:

Output Table	0xxx(x)
Registers	4xxx(x)

Modicon

Reads from the following memory types on Modicon controllers:

Coils	0xxx(x)
Inputs	1xxx(x)
Holding Registers	4xxx(x)
Input Registers	3xxx(x)

Writes to the following memory types on Modicon controllers:

Coils	0xxx(x)
Holding Registers	4xxx(x)

Caution

When writing to Coils (0xxxx), memory protect and coil disable are overwritten.

On Modicon controllers, coils that are not programmed in the controller logic program are not automatically cleared on powerup. This means that if a coil is set to 1, the output will remain HOT until explicitly set to 0.

Writing to Holding Registers overrides the controller memory protect.

Double Precision Notes

D4xxxx points are Holding Register Points interpreted as Double Precision. Two registers are used for each point with both registers are assumed to have a positive value.

Because of this mapping:

- Do not declare Double Precision points with overlapping addresses. For example, D40001 and D40002 overlap, while D40001 and D40003 do not.
- Do not define points that use the same Holding Register and Double Precision point address (for example, defining one point with the address D40001 and another with the address 40001).

Configure Double Precision points as DINT or DUINT point.

Arrays are not supported for Double Precision points.

Required Documents

You should have the following document available when configuring a Series Six for MODBUS RTU communications:

Series Six Programmable Controllers Data Communications Manual (GFK-25364)

For all other programmable controllers, you should have the documentation for the controller available.

Hardware Configuration Requirements

The MODBUS RTU protocol allows one master and up to 247 slaves on a common line. The CIMPLICITY MODBUS RTU Communications Enabler is the master.

Many configurations limit the number of slaves to a smaller number. For example, Goulds's J478 modem restricts the number of slaves to 32. Contact your hardware vendor for information about the number of slaves that your hardware configuration can support.

Hardware Installation

Controller Configuration

When configuring controllers for use with CIMPLICITY, the following steps should be taken:

1. Configure the controller/communications card for MODBUS RTU communications.
2. Assign each slave within the configuration a unique slave address between 1 and 247 (decimal).
3. Configure all slaves at the same baud rate and parity as the master (CIMPLICITY).

CIMPLICITY Hardware Configuration

The MODBUS RTU Communications Enabler communicates via a serial connection between the CIMPLICITY host computer and the slave controllers.

Connect the PC to the Controller

To connect the Display Station to a Series Six PLC with a CCM3 card installed, refer to the *Series Six Programmable Controllers Data Communications Manual* (GFK-25364).

Serial Port Configuration

The Display Station has two serial communication ports, COM1 and COM2. On Display Station products that run Windows 95, you can use either port for MODBUS RTU device communications. On systems that run Windows NT, the COM1 port is dedicated to the touch screen.

No special port configuration is required.

Validating Communications

You can use the MODBUS RTU Diagnostic Program, MB_TEST, provided with the MODBUS RTU device communication enabler to check the basic configuration and operation of your network without starting CIMPLICITY software. You can perform the following functions:

- Read test
- Write test

For this program to function, CIMPLICITY software's MODBUS RTU device communication enabler must be successfully installed, and you must have configured the MODBUS RTU ports and devices using CIMPLICITY application configuration functions.

This program *cannot* be used at the same time as the MODBUS RTU device communication enabler over the same communications port.

To start the program:

1. Open the Configuration Cabinet for the project where the MODBUS RTU driver is configured.
2. Stop the project.
3. From the Tools menu, select Command Prompt....
4. In the *Command Prompt* window, type the command to invoke the diagnostic test you wish to perform.

The format for the command is:

mb_test [-B<baud rate>] [<parity>] [-T<port_id>]
[-S<slave id>] [-R<address>] [-C<count>]

where:

-B<baud rate>	Defines the speed of the terminal line. (Default value is 9600.)
<parity>	Defines the parity for communications. Choose one of the following: -E Defines EVEN parity -O Defines ODD parity -N Defines NO parity If no parity is specified, the default is EVEN parity.
-T<port id>	Defines the port to be used for communications. (Default value is COM1)
-S<slave id>	Defines the slave to be addresses (Default value is 1.)
-R<address>	Defines where on the slave controller a read should begin. (Default is no read, just device connect.)
-C<count>	Defines the number of elements to read (Default is 1 element.)

For example, to read the first five holding registers on slave 7 from COM2 at 4800 baud using ODD parity, the command would be:

```
$ mb_test -B4800 -O -S7 -TCOM2 -R40001 -C5
```

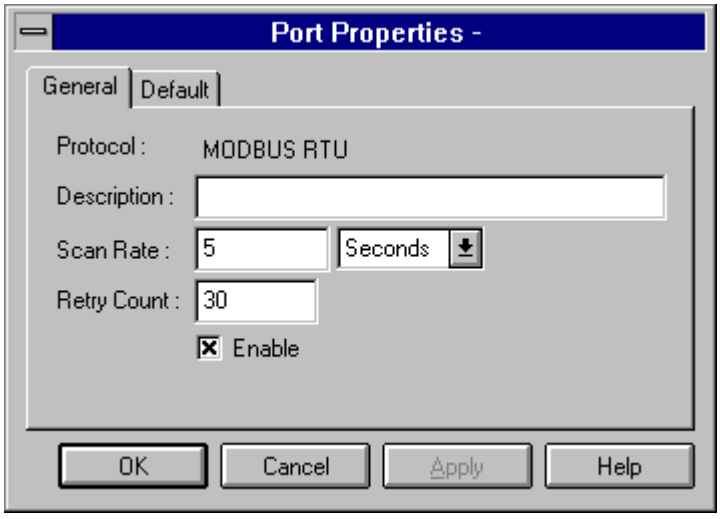
Application Configuration

When you configure ports, devices, and points that use the MODBUS RTU device communication enabler, some fields must contain unique values for the communications to work successfully. These are detailed below. Refer to the *CIMPLICITY for Windows Base System User's Manual* (GFK-1180) for details pertaining to configuring ports, default properties, and devices in a CIMPLICITY project.

Port Configuration

When you configure a port for MODBUS RTU device communications, the Port Properties dialog box for the protocol will be displayed.

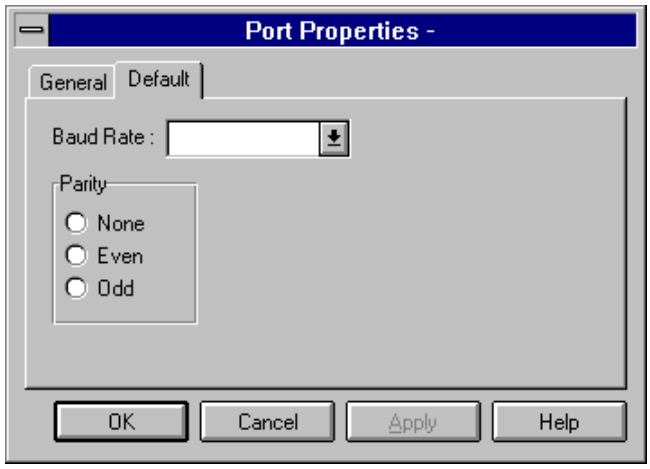
General Properties



Use the General properties tab to enter general information for the port. You can define the following:

Description	Enter an optional description to help you identify the port.
Scan Rate	Enter the base scan rate for the port. Point scan rates will be multiples of the base rate. You can specify a scan rate in Ticks, Seconds, Minutes, or Hours.
Retry Count	Enter the number of times to retry communications to a device on this port after a communications error is detected. Enter the number of scans to wait before attempting to reconnect to a device after a communications error has been detected. If communications cannot be established for a device on the port, the device is considered to be down and a $DEVICE_DOWN alarm is generated. Once a device is down, periodic attempts are made to resume connections to it.
Enable	Click an "X" in this box if you want the port to be enabled when the project starts. If you leave this box blank, the port will not be enabled when the project starts, and points will not be available for devices on the port.

Default Properties



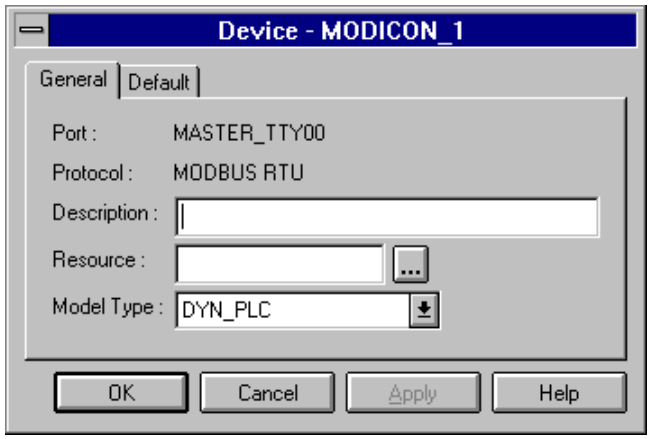
Use the Default properties tab to enter general information for the port. You can define the following:

Baud Rate	Enter the baud rate for communications. Click the drop-down list to the right of the input field and select a rate from the list.
Parity	Select the parity to be used for communications.

Device Configuration

When you configure a Modicon or GE Fanuc programmable controller for MODBUS RTU communications, the Device Properties dialog box for devices using this protocol will be displayed.

General Properties



Use the General properties tab to enter general information for the device. You can define the following:

Description Enter an optional description to help you identify the device.

Resource Enter a resource that can be associated with this device for alarm generation.

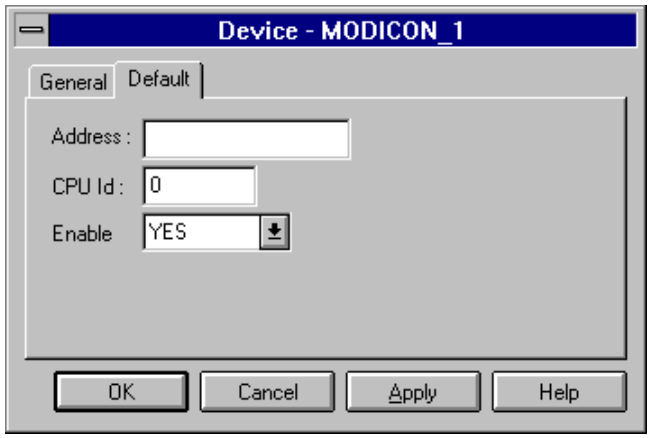
Model Type Select the type of device. Click the drop-down button to the right of the input field to display your choices, then make a selection. For this protocol, the choices are:

GOULD 484	GOULD M84
GOULD 584	STAT_PLC
GOULD 884	DYN_PLC
GOULD 984	

If you select STAT_PLC, the size of the registers is fixed at the maximum possible size.

If you select DYN_PLC, the size of the registers is determined at run time.

Default Properties



Use the Default properties tab to enter information about MODBUS RTU communications for the device. You can define the following:

Address *Not used*

CPU ID Enter the slave address of the device. For the Series Six, it should correspond to the CPU ID of the attached Series Six.

Valid slave addresses range from 1 to 247 decimal.

Broadcast mode (slave address 0) is *not* supported by the MODBUS RTU Device Communications enabler.

Enable Select Yes to enable the device when the project starts. If you select No, the device will not be enabled and points associated with the device will be unavailable.

Point Configuration

Once your devices are configured, you may configure points for them. Through device point configuration, you may configure the following:

- Points that read or set Coils
- Points that read Discrete Inputs
- Points that read Input Registers
- Points that read or set Holding Registers
- Points that read or set General Reference
- Points that read or set Holding Registers as Double Precision

The fields described below have configuration values that are unique to, or have special meaning for MODBUS RTU communications.

Access

The type of access depends on the point address.

Enter READ for points from Discrete Inputs or Input Registers.

Enter READ or WRITE for points from Coils or Holding Registers.

Update Criteria

The update criteria determines how the data will be requested.

Enter ON_CHANGE or ON_SCAN for all points.

Address

Enter the point address of the data as follows:

0xxxx for Coils

1xxxx for Discrete Inputs

3xxxx for Input Registers

4xxxx for Holding Registers

where xxxx is the bit number or register number of the point. For example, the address of Holding Register one is 40001, and the address of Coil one is 00001. All address must contain exactly five digits to be valid.

If you are configuring an ANALOG point type in Discrete Inputs or Coils, the address entered in this field must be that of the least significant bit of the point. For example, if you configure a 16-bit analog point for Coils 17 through 32, enter 00017 in this field.

When you configure DIGITAL points in Holding Registers or Input Registers, you must also enter data in the following field:

Bit Offset Enter the bit offset in the Holding Register or Input Register that defines the point, where 0 is the least significant bit, and 15 is the most significant bit.

Chapter 10 Diagnostics and Troubleshooting

This chapter consists of three sections: “Self-Test Diagnostics,” “Troubleshooting,” and “Corrective Actions.” The first section describes how to respond to errors that could be detected by the automatic self test that is performed each time the Display Station powers up. The “Troubleshooting” section contains tables of symptoms, their possible causes, and recommended corrective actions. The “Corrective Actions” section contains detailed procedures that are too lengthy to include in the Troubleshooting tables.

- Self-Test Diagnostics 10-2
  - System Test and Initialization 10-2
  - System Configuration Verification 10-2
- Troubleshooting 10-3
  - Powerup 10-3
  - Display 10-4
  - Memory 10-5
  - Touch Screen 10-5
  - Serial Mouse (Windows 95 Systems Only) 10-6
  - External Keyboard 10-7
  - Communications 10-8
  - Printing 10-9
- Corrective Actions 10-11
  - Enabling Touch Screen Operation 10-11
  - Calibrating the Touch Screen 10-14
  - Deleting the PS/2 Mouse Driver 10-16
  - Installing the Serial Mouse Driver 10-18
  - Enabling Touch Pad Mouse Operation 10-20
  - CMOS Checksum Error 10-22

Self-Test Diagnostics

The computer automatically performs self-test diagnostics each time it is powered up. The self-test consists of a series of checks that verify correct performance of the computer hardware. When the self-test is being performed, you will see the message XXXX KB OK displayed on the screen, where XXXX is a number that increases until it matches the amount of usable memory.

System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will see an error message on the screen. There are two kinds of errors: fatal and non-fatal. If a non-fatal error occurs, the system can usually continue the boot up sequence. Non-fatal error messages usually appear on the screen with the following instruction:

```
press <F1> to RESUME
```

Write down the message and press the **F1** key to continue the bootup sequence.

System Configuration Verification

These routines check the current system configuration against the values stored in the CMOS memory. If they don't match, the program will generate an error message. To correct this condition, you will need to run the BIOS setup program and correct the configuration information in memory. (Refer to Appendix B.)

There are three situations in which you might need to change the CMOS settings:

1. You are starting your system for the first time.
2. You have changed the hardware attached to your system.
3. The CMOS memory had lost power and the configuration information has been erased. If this has happened, call GE Fanuc's CIMPLICITY hotline. (Please see "Customer Support" in Chapter 1.)

Troubleshooting

Powerup

Symptom	Possible Causes	Solution
Display Station does not power up.	Power supply not on (PWR indicator not lighted).	Make sure that Display Station is plugged in. Make sure that power supply is functioning properly.
Display is blank (PWR indicator is lighted).	See "Display" on page 10-4.	See "Display" on page 10-4.
`Non-System disk or disk error` message displayed.	Disk in floppy disk drive.	Remove floppy disk and press any key. Or, remove floppy disk and then reboot or power cycle.
`Safe Recovery Error` message displayed.	Occurs on initial power up if the unit is accidentally turned off without first shutting down the Windows 95 or Windows NT software.	Press **ENTER** (Continue). The Display Station will power up normally.
Memory count during powerup self-test is incorrect.	Optional SIMM is installed incorrectly or is incompatible with the Display Station CPU.	Make sure that the appropriate memory card is installed correctly.
`CMOS checksum error – Defaults loaded` `CMOS battery failed` message displayed.	CMOS battery failure.	**Note:** This battery has a lifetime of up to 10 years under normal operating conditions. The battery is not field replaceable. For more information, see "CMOS Checksum Error" on page10-22.
A screen appears just after powerup, or just after reset, which has the title "CMOS Setup Utility."	The **DEL** key has been accidentally pressed.	Press the RESET button and power up again. Or, press the **CAN** (Cancel) key once or twice, until prompted to exit without saving. Then, press **SHIFT** + **9** (for yes) and the **ENTER** key. The Display Station will then power up normally.
A DOS prompt, C:>, appears on the screen instead of the software.	The **F5** or **F8** function key has been accidentally pressed during powerup or after the RESET switch was pressed.	Press the RESET switch and do not press any keys until after the screen for the system software appears.
The Display Station reset even though the power was not interrupted and the reset button was not pressed.	The **CTRL**-**ALT**-**DEL** keys were pressed twice at the same time.	This should never be done, unless you are attempting to reset the Display Station.

Display

Note

Wait until the unit has been powered up for an hour before making final adjustment of the contrast. (To adjust, turn the CONTRAST knob on the right side of the unit.)

If the unit will be used in an environment where the ambient temperature is likely to vary, adjust for best viewing when the unit has stabilized at the middle of the temperature range. For example, if you expect the ambient temperature to vary from 0 to 45°C, let the unit stabilize at 23°C, then make the adjustment. This provides acceptable viewing at 0 to 45°C. If you expect the temperature to vary from 25 to 45°C, adjust the contrast at 35°C.

Symptom	Possible Causes	Solution
Characters are dim.	Contrast control is not set properly.	Adjust the Contrast control, located on the right panel of the Display Station.
	Computer screen is in direct light.	Change lighting or adjust contrast.
Display is blank (PWR indicator is lighted).	Contrast needs adjusting.	Adjust the Contrast control.
	Screen has overheated.	If Display Station is in direct sunlight, move it and allow it to cool.
	Display Station is set up for external display.	Using an external display, run STN.COM in the GEFUTIL directory to reset the Display Station. If you don't have an external display, reset the computer (press the RESET button on the right panel of the Display Station).
	Screen saver is active.	Touch the touch screen, Touch Pad mouse, or a key on the keypad .
Video appears scrambled while CIMPLICITY is loading.	Display Station was not configured for 16 colors before upgrading to 32MB memory.	Refer to "For 32MB Upgrades" under "Installation Procedure" in Chapter 5.

Memory

Symptom	Possible Causes	Solution
Memory count during powerup self-test is incorrect.	Optional SIMM is installed incorrectly or is incompatible with the Display Station CPU.	Make sure that the appropriate memory card is installed correctly.
`Out of Memory` message is displayed or insufficient memory error occurs during operation.	System ran out of memory for the application.	Check the memory requirements for the application. (Refer to the application documentation.) Install additional memory.
	Too many terminate and stay resident (TSR) programs running.	Modify the startup folder to use only those TSR applications that are really needed.

Touch Screen

Note

Operating temperature can affect touch screen calibration. Calibrating the touch screen is an easy procedure. Simply recalibrate it if it is slightly off. (See page 10-14.)

Symptom	Possible Causes	Solution
Cursor does not respond at all to touch.	Touch screen disabled.	Set up for touch screen operation (see "Enabling Touch Screen Operation").
	Touch screen driver accidentally deleted.	Reinstall touch screen driver
	System is busy.	Press **CTRL-ALT-DELETE** to view task list.
Cursor moves but does not follow your touch accurately.	Touch screen not calibrated properly.	Run calibration program. See "Calibrating the Touch Screen."
Touch screen responds erratically to touch; cursor might not be visible.	Display Station is set up for PS/2 mouse. Note: This occurs if the Auto Hardware Detect utility is run. GE Fanuc does ***not*** recommend using the Auto Hardware Detect utility when adding options.	Perform procedure in "Deleting the PS/2 Mouse Driver." Then set up for touch screen operation (see "Enabling Touch Screen Operation".)

Touch Pad Mouse

Symptom	Possible Causes	Solution
Cursor does not respond at all to touch.	Mouse driver accidentally deleted.	Reinstall mouse driver. See "Enabling Touch Pad Mouse Operation" on page 10-20.
	System is busy.	Press **CTRL-ALT-DELETE** to view task list.
	Grease or other chemical residue is on the surface.	Clean the surface with alcohol or ammonia-based glass cleaner.
	Gloves, chemicals, or dirt on hands.	Remove gloves, or clean your hands.
The pointer bounces back after you remove your finger.	Mouse Properties not set up correctly.	Refer to "Touch Pad Mouse Setup" on page 10-21.
Touch Pad mouse responds erratically	Mouse Properties not set correctly	Refer to "Touch Pad Mouse Setup" on page 10-21. Make sure that the Pressure Sensitive box is checked. Adjust the Touch Threshold setting toward the Heavy end of the scale.
Virtual Scroll Bar feature does not work.	Mouse Properties not set correctly.	Refer to "Touch Pad Mouse Setup" on page 10-21. In the Touchpad Enhancements dialog, the Enable Enhancements box should be checked. Adjust the scroll zone if necessary. (Virtual Scroll Bar will not work if the scroll zone is not wide enough to be visible on the right side of the adjustment window.)
Mouse does not respond to taps.	Taps feature has been disabled in Mouse Properties screen.	Refer to "Touch Pad Mouse Setup" on page 10-21. Make sure the Tap and Drag feature is selected.
	The High Report Rate box is not checked.	Make sure this box is checked. (See "Touch Pad Mouse Setup" on page 10-21.)
The cursor is stuck in a window.	Edge Finder feature is enabled.	Try moving the cursor a second time. With Edge Finder feature enabled, cursor moves out of window the second time you move it. If you want to disable Edge Finder feature, see "Touch Pad Mouse Setup" on page 10-21.

External Serial Mouse (Windows 95 Systems Only)

Symptom	Possible Causes	Solution
Cursor does not respond to mouse movement	Serial mouse not plugged in.	Plug mouse into COM1 port on Display Station.
	The type of mouse is not supported.	Use a serial mouse.
	System is busy.	Press **CTRL-ALT-DELETE** to view task list.
	Mouse not detected.	Restart Display Station product with external mouse connected.
	Correct driver not installed.	Make sure that Logitech Serial Mouse driver is loaded. Refer to "Installing the Serial Mouse Driver" on page 10-18.

Keyboard

Symptom	Possible Causes	Solution
External keyboard locks up	The type of keyboard is not supported.	Use a Key Tronic keyboard. (Most PS/2 keyboards will work. However, we recommend a keyboard manufactured by Key Tronic.)
	Keyboard not plugged into keyboard port on Display Station.	Plug keyboard in.
	System is busy.	Press **CTRL-ALT-DELETE** to view task list.
Internal Keyboard	System is busy.	Press **CTRL-ALT-DELETE** to view task list.

Communications

PLC/CPU Connection

Symptom	Possible Causes	Solution
CIMPLICITY does not communicate with a PLC that has been autoconfigured (AUTOCONFIG/DEFAULT/I/O error).	The system is attempting to communicate with a 90-30 PLC using the SNP driver and a CIMPLICITY project.	1. With the PLC powered up and connected to the Display Station, establish communication between the Display Station and PLC via the 90-30 SNP driver. 2. Using a Hand-Held Programmer, toggle the Default I/O (Enable or Disable) configuration parameter for the CPU. Communications between the Display Station and the PLC will be stopped. (Communications are stopped when you toggle from Enable to Disable, or vice versa.) 3. Power cycle the PLC.
Communications between the host computer and the controller are unsuccessful.	COM port not configured in system.	Verify that the COM port is configured in the system.
	Cabling between computer and controller.	Verify that the cable between the computer and the controller is correctly wired.
	Baud rate and parity configured incorrectly.	Verify that the baud rate and parity on the computer are consistent with those on the controller.
	Wrong address.	Verify that the slave address is correct.

MODBUS RTU Communications

Symptom	Possible Causes	Solution
Communications between the host computer and the controller are unsuccessful.	COM port not configured in system.	Verify that the COM port is configured in the system.
	Cabling between computer and controller.	Verify that the cable between the computer and the controller is correctly wired.
	Baud rate and parity configured incorrectly.	Verify that the baud rate and parity on the computer are consistent with those on the controller.
	MODBUS port not configured for RTU communications.	Verify that the controller's MODBUS port is configured for RTU communications.
	Wrong address.	Verify that the slave address is correct.

Network Communications

Symptom	Possible Causes	Solution
Conflicts on network.	IP Address not unique.	Change the IP address to a unique address. (See “Using TCP/IP Communications” in Appendix C.)

Printing

Symptom	Possible Causes	Solution
Printer will not turn on.	Cables not connected properly. Printer power cord not plugged in.	Ensure that the cables are properly connected and that the power cord is connected to the electrical outlet.
Printer will not print.	Printer is not turned on.	Turn on the printer
	Printer is not online.	Set the printer to online.
	The device drivers for your application are not installed.	Install the correct printer drivers for your application in Windows.
	Printer that is set up for a network is not connected to the network.	Connect the printer to the network.
	Printer cable is too long, unshielded, or defective.	Replace the cable.
Printer is offline.	Paper tray is empty.	Fill the paper tray with paper. Set printer to online.
Printer prints garbled information.	Correct printer drivers not installed.	Install the correct printer driver.
	Cable is not connected properly.	Ensure that the printer cable is connected properly to the computer.
	Problem specific to printer.	Run a printer self-test. Refer to the documentation provided with your printer for instructions. If the self-test fails, the problem is printer-specific. The printing section of the software documentation and in Windows online Help may also be helpful.

Corrective Actions

Enabling Touch Screen Operation

Reloading the Touch Screen Driver (Windows 95)

From the Hard Disk

1. Plug a standard PS/2-type keyboard into the Display Station's KEYBOARD port.
2. To display the Start menu, press **CTRL** + **ESC**.
3. Press the down cursor key (↓) until the Settings option is selected. Press **ENTER**.
4. Select the Control Panel option and press **ENTER**. The Control Panel window will be displayed.
5. Press the right cursor key (→) until the Add New Hardware icon is selected. Press **ENTER.** The Add New Hardware Wizard window will be displayed.

Add New Hardware Wizard
This wizard will help you quickly install a new piece of hardware.
To begin installing your new hardware, click Next.
< Back
Next >
Cancel

6. The Next option should be selected by default. (If the Next option is not selected, press **TAB** until it is.) Press **ENTER** The following dialog box will be displayed.

Add New Hardware Wizard
If your hardware is already installed, you should have Windows detect it.
When Windows detects new hardware, it automatically determines the current settings for the device and installs the correct driver.
Do you want Windows to search for your new hardware?
Yes (Recommended)
No
< Back
Next >
Cancel

7. The dialog box shown in step 6 asks you:

   ```
   Do you want Windows to search for your new hardware?
   ```

   Caution

   Do *not* select the Yes option. If you select the Yes option, the software will default to the standard PS/2 mouse, which will conflict with the touch screen. If this happens, you will need to delete the PS/2 mouse and restart the Display Station. (See "Deleting the PS/2 Mouse Driver" page 10-14.)

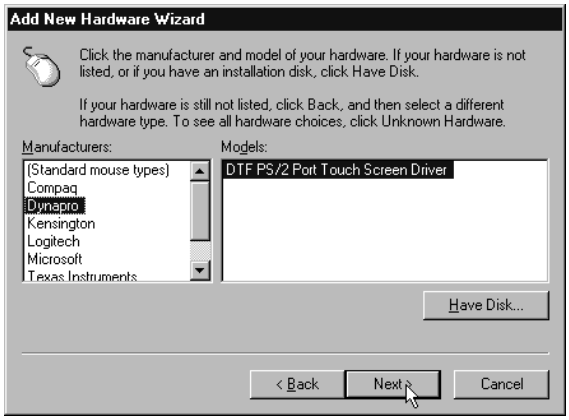
   If you accidentally select the Yes option and go to the next screen, click the Back button to return to the first Wizard window and select the No option.

   Press the ↓ key to select the No option.

8. Press **ENTER**. The following dialog box will be displayed.

9. Press the ↓ key to select Mouse. Press **ENTER**. The next dialog box in the Add New Hardware Wizard will be displayed.

10. Press the ↓ key to select Dynapro in the list of Manufacturers. In the Models list, DTF PS/2 Port Touch Screen Driver should be displayed.


Add New Hardware Wizard
Click the manufacturer and model of your hardware. If your hardware is not listed, or if you have an installation disk, click Have Disk.
If your hardware is still not listed, click Back, and then select a different hardware type. To see all hardware choices, click Unknown Hardware.
Manufacturers:
Models:
(Standard mouse types)
Compaq
Dynapro
Kensington
Logitech
Microsoft
Texas Instruments
DTF PS/2 Port Touch Screen Driver
Have Disk...
< Back
Next >
Cancel

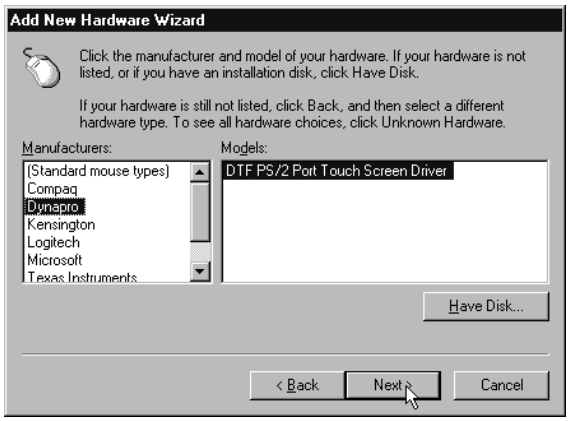
11. Press **ENTER** (Next). The following screen will be displayed.

Add New Hardware Wizard
Windows can continue installing your hardware now.
To continue installing the software needed by your hardware, click Finish.
< Back
Finish
Cancel

12. Press **ENTER** (Finish). The Add New Hardware Wizard will finish the hardware installation.
13. The driver will start to load. It will then stop and ask for the location of the ECAL.DAT file. Type **c:** for the directory and press **ENTER**.
14. The driver will stop again and ask for the location of more files. Type **c:\windows\system** for the directory.
15. After the driver has completed its load process, you must restart Windows for the touch screen to function.

From the Utilities Disk

If you cannot load the touch screen driver from the hard disk, you can load it from the Utilities disk provided with the Display Station. To load the driver from the Utilities disk, select the Have Disk option in the Add New Hardware Wizard dialog box.

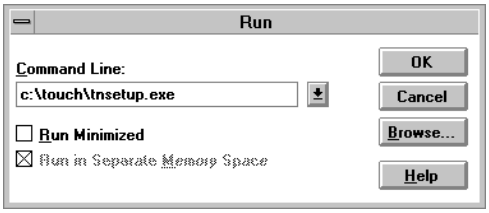

Add New Hardware Wizard
Click the manufacturer and model of your hardware. If your hardware is not listed, or if you have an installation disk, click Have Disk.
If your hardware is still not listed, click Back, and then select a different hardware type. To see all hardware choices, click Unknown Hardware.
Manufacturers:
Models:
(Standard mouse types)
Compaq
Dynapro
Kensington
Logitech
Microsoft
Texas Instruments
DTF PS/2 Port Touch Screen Driver
Have Disk...
< Back
Next >
Cancel

Insert the Utilities disk in the external drive (a:). In the Copy Manufacturer's Files From dialog box, change the path to A:\TOUCH and press **ENTER**.

Reloading the Touch Screen Driver (Windows NT)

The touch screen driver can be re-installed from the hard drive by running the setup utility, C:\TOUCH\TNSETUP.EXE. Or, you can install it from the Utilities disk provided with the system by running A:\TOUCH\TNSETUP.EXE.

1. From the Windows NT File menu, select Run.
2. In the Run window, type the command line and press Enter.
3. Select COM1 and the default parameters provided for COM1 in the setup.

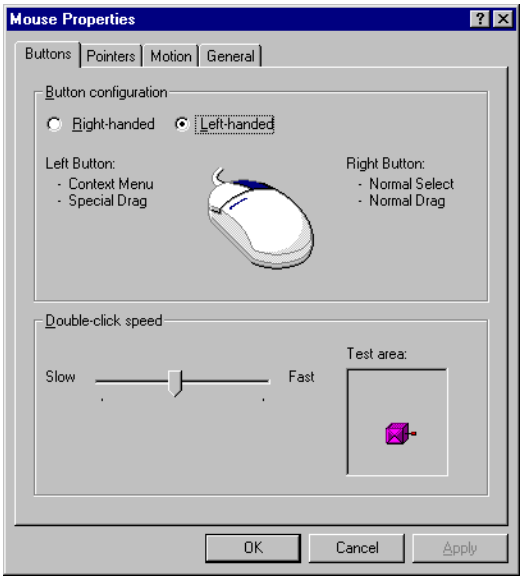


Calibrating the Touch Screen

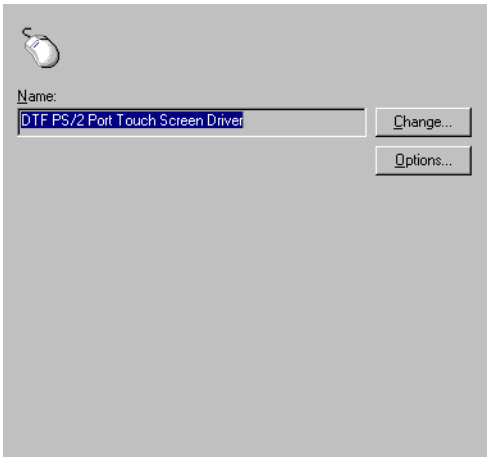
Note

Operating temperature can affect touch screen calibration. Wait until the Display Station has been powered up for a few hours before deciding whether you need to calibrate the touch screen. Calibrating the touch screen is an easy procedure. If it is slightly off, simply recalibrate it using the following procedure.

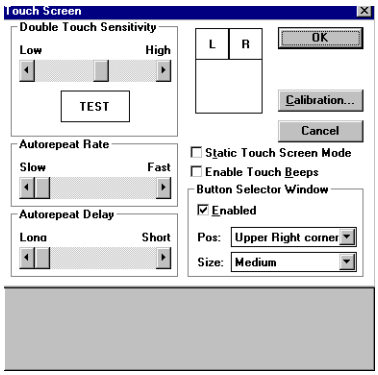
1. Open the Windows Control Panel and double-click the Mouse icon. The following Mouse Properties window will appear



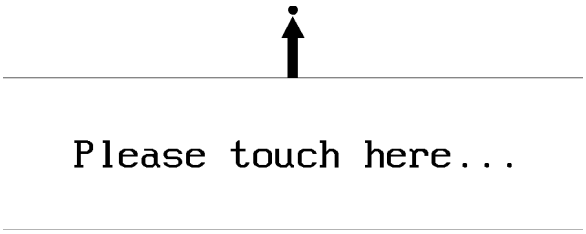
2. Select the Tab labeled General.



3. From the General tab, select Options. This displays the Touch Screen dialog box, which allows you to adjust the double click rate for the touch screen or calibrate the touch screen.



4. Click Calibration . . . in the Touch Screen dialog box. The following message will appear:



Caution

Do not use a sharp object to touch the touch screen.

The calibration program will prompt you to touch the dot on all four sides of the screen. Be sure to *gently* touch the very edge of the screen, otherwise the cursor will not follow your finger properly when you move it across the screen. When you have finished, the Touch Screen dialog box will reappear.

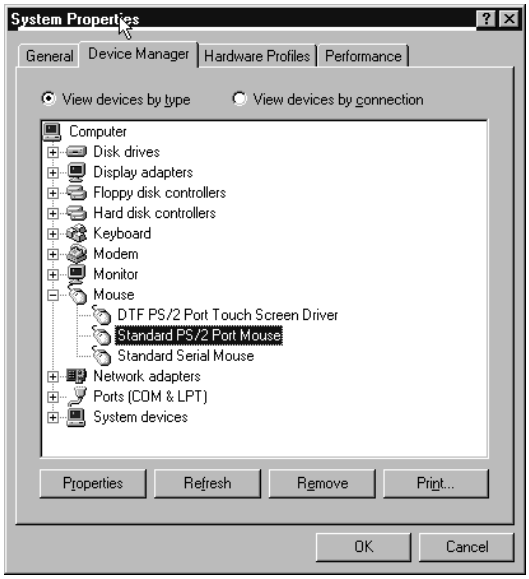
5. Click OK to save your touch screen settings.

Deleting the PS/2 Mouse Driver (Windows 95 Systems)

If you have accidentally installed the PS/2 mouse driver, you will need to delete it before you can reinstall the touch screen driver. This procedure is necessary because the PS/2 mouse driver conflicts with the touch screen driver.

1. Plug a standard PS/2-type keyboard into the Display Station's KEYBOARD port.
2. Press **CTRL** + **ESC** to display the Start menu.
3. Press the down cursor key (↓) until Settings is selected. Press **ENTER**. The Settings menu will be displayed (Control Panel will be the default selection.)
4. Press **ENTER**. The Control Panel window will be displayed.
5. Use the cursor keys(→, ↓) to select the System icon. Press **ENTER**. The System Properties window will be displayed.

6. Press the **TAB** key to select the General tab and then the → key to select the Device Manager tab. A list of hardware devices will be displayed.
7. Press the **TAB** key twice to highlight the Computer line.
8. Press the ↓ key to move down the list of hardware devices in the Computer folder until Mouse is selected.
9. Press the → key to open the list of Mouse device drivers.



10. Press the ↓ key to select the Standard PS/2 Port Mouse.
11. Press **TAB** until the Remove option is highlighted. Press **ENTER**. The Confirm Device Removal dialog box will be displayed.

12. Press **ENTER**. The Device Manager tab will be displayed.
13. Press **TAB** to select the Close option. Press **ENTER**.
14. Set up the Display Station for touch screen operation (see page 10-11).

Installing the Serial Mouse Driver

To install the serial mouse driver from the Utilities disk:

1. To display the Start menu, press **CTRL** + **ESC**.
2. Press the down cursor key (↓) until the Settings option is selected. Press **ENTER**.
3. Select the Control Panel option and press **ENTER**. The Control Panel window will be displayed.
4. Use the cursor keys to select the New Hardware icon and press **ENTER.** The Add New Hardware Wizard window will be displayed.

Add New Hardware Wizard
This wizard will help you quickly install a new piece of hardware.
To begin installing your new hardware, click Next.
< Back
Next >
Cancel

5. Select the Next button and press **ENTER** The following dialog box will be displayed.

Add New Hardware Wizard
If your hardware is already installed, you should have Windows detect it.
When Windows detects new hardware, it automatically determines the current settings for the device and installs the correct driver.
Do you want Windows to search for your new hardware?
Yes (Recommended)
No
< Back
Next >
Cancel

6. The dialog box shown in step 5 asks you:

```
Do you want Windows to search for your new hardware?
```

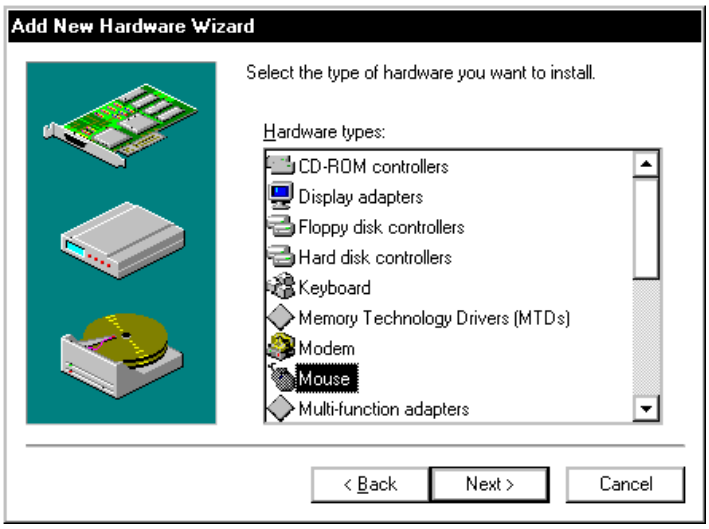
Caution

Do *not* select the Yes option. If you select the Yes option, the software will default to the standard PS/2 mouse, which will conflict with the touch screen. If this happens, you will need to delete the PS/2 mouse and restart the Display Station. (See "Deleting the PS/2 Mouse Driver" page 10-14.)

If you accidentally select the Yes option and go to the next screen, click the Back button to return to the first Wizard window and select the No option.

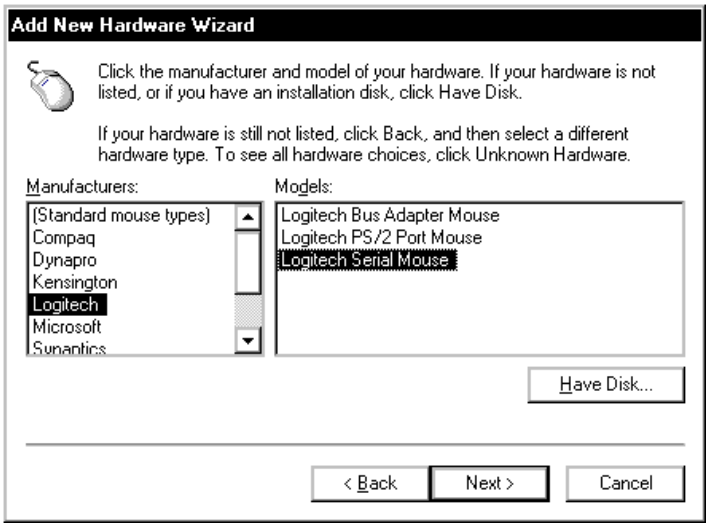
Press the ↓ key to select the No option.

7. Press **ENTER**. The following dialog box will be displayed.



8. Press the ↓ key to select Mouse. Press **ENTER**. The next dialog box in the Add New Hardware Wizard will be displayed.

9. Press the ↓ key to select Logitech in the list of Manufacturers. In the Models list, select Logitech Serial Mouse.


Add New Hardware Wizard
Click the manufacturer and model of your hardware. If your hardware is not listed, or if you have an installation disk, click Have Disk.
If your hardware is still not listed, click Back, and then select a different hardware type. To see all hardware choices, click Unknown Hardware.
Manufacturers:
Models:
(Standard mouse types)
Compaq
Dynapro
Kensington
Logitech
Microsoft
Synaptics
Logitech Bus Adapter Mouse
Logitech PS/2 Port Mouse
Logitech Serial Mouse
Have Disk...
< Back
Next >
Cancel

10. When Windows 95 prompts you to restart the computer, press **ENTER** (Yes). When Windows 95 restarts, you should see the TouchMeter icon next to the clock in the right side of the task bar.

Enabling Touch Pad Mouse Operation

How To Install the Driver Software

Making an Installation Floppy Disk

Unzip the Synaptics 4.1.10 driver on a formatted floppy drive. You can download the Touch Pad mouse driver from the Synaptics site on the World Wide Web at

http://www.synaptics.com

1. Download the compressed driver software file to a convenient temporary directory on your Glide Station unit (for example C:\SYNTOUCH).
2. Uncompress the downloaded file, using an unzip utility. (You can download an unzip utility from the Web site, if you do not already have one.)
3. Follow steps 1 through 7 in “Installing the Driver from Floppy Disk or the Hard Drive.”
4. In the Install From Disk dialog box, type the name of the directory that contains the uncompressed driver files (for example, C:\SYNTOUCH).
5. Follow steps 9 through 11 in “Installing the Driver from Floppy Disk or the Hard Drive.”

Installing the Driver from Floppy Disk or the Hard Drive

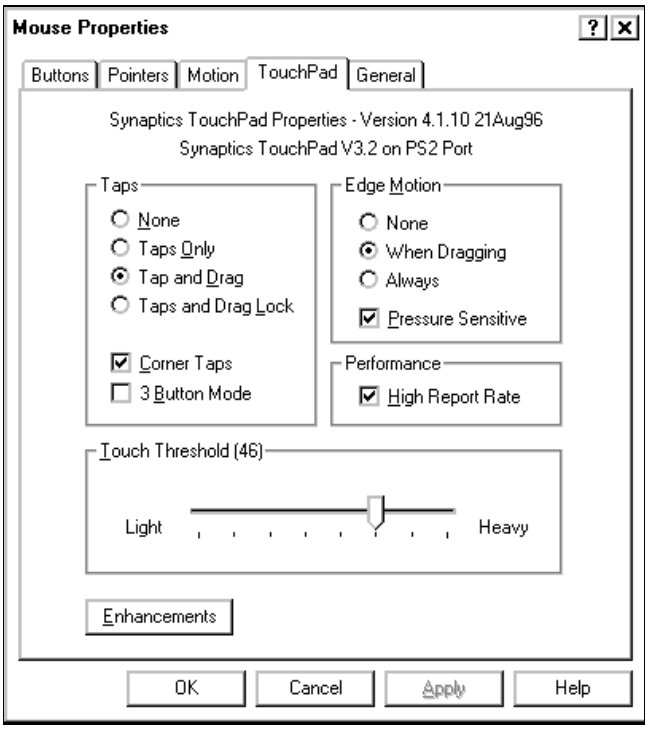
1. If installing from floppy disk, insert the floppy disk into your disk drive A:
2. Open the Windows 95 Start menu. Select Settings.
3. Select Control Panel.
4. Double-click on the Mouse icon.
5. Select the General tab (along the top of the page).
6. Click the “Change…” button.
7. Click the “Have Disk…” button.
8. Enter A: as the name of the drive if installing from floppy, or enter **c:\synaptics** as the name of the drive if installing from the hard drive.
9. Select PS/2 as the type of device.
10. Windows will load the new software.
11. Click the Close button at the bottom of the Mouse control panel.
12. When the Windows software asks if you want to restart your computer, select YES. If installing from floppy disk, remove the disk from the A: drive.
13. A Synaptics window will pop up. Click the box to never show this message again and close the window.
14. Set the Touch Pad mouse settings as described in “Touch Pad Mouse Setup.”

Touch Pad Mouse Setup

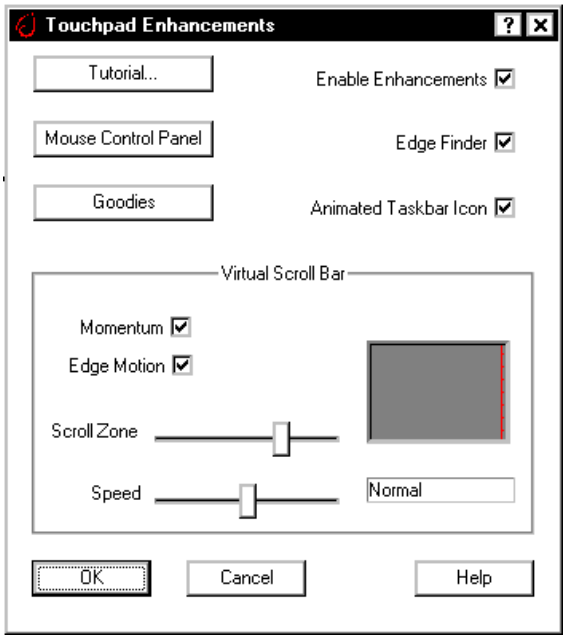
Note

For definitions of the TouchPad Mouse Properties and Touchpad Enhancements settings, refer to “Touch Pad Mouse Settings” in Chapter 2.

1. Open the Windows 95 Start menu. Select Settings.
2. Select Control Panel.
3. Double-click on the Mouse icon.
4. Select the TouchPad tab (along the top of the page).
5. Set the settings as follows:



6. Click the Enhancements button and set the setting as follows:



7. Click OK to save the settings.

CMOS Checksum Error

If the CMOS battery has failed, the following error messages will be displayed on the screen:

```
CMOS checksum error - Defaults loaded

CMOS battery failed
```

If you see the above message, you can still operate the Display Station by pressing the **DELETE** key and manually setting up the system. (You will need to set up the computer each time the system is powered up.) For setup parameters, refer to Appendix B. You must complete all the setup options except "Loading BIOS Defaults."

This battery has a lifetime of up to 10 years under normal operating conditions. The battery is not field replaceable. The Display Station unit must be returned to GE Fanuc to correct the problem.

Appendix A

Port Configuration and Cabling

This appendix provides port configuration and cable assembly information for the CIMPLICITY Display Station computer. The following topics are covered:

- Ports A-2
  - Ethernet A-2
  - Coaxial BNC Ethernet A-3
  - AC Power A-4
  - External Display A-4
  - External Keyboard A-5
  - Serial Port 2 (RS-422/232) A-6
  - Serial Port 1 (RS-232) A-10
  - Parallel Port A-11
  - Accessory Port A-12
- Cable Specifications A-13
- Cable Diagrams A-14
  - Serial Port 2 (RS-422/232) A-14
  - Serial Port 2 (Configured for RS-232) A-15
  - Serial Port 1 (RS-232) A-15
  - Communications Coprocessor Module Interface A-20

Port Configurations

Ethernet

The Display Station provides two types of Ethernet ports: an AUI (10Base2 or 10Base5) and an RJ-45 (10BaseT) connector. The AUI connector is a 15-pin female D-type connector, as shown in Figure A-1. A pinout listing is provided in Table A-1. The RJ-45 twisted pair connector is an 8-pin MAU MDI connector, as shown in Figure A-2, with pinout listing in Table A-2.

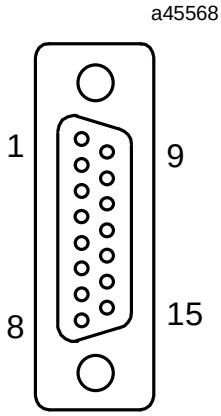


Figure A-1. AUI Ethernet Port Connector Configuration

Table A-1. Pinout Listing for the AUI Port

Pin No.	Signal	Description
1	GND	Signal Ground
2	CP+	Collision Presence +
3	TX+	Transmit +
4	GND	Signal Ground
5	RX+	Receive +
6	GND	Signal Ground
7	NC	No connection
8	NC	No connection
9	CP-	Collision Presence -
10	TX-	Transmit -
11	GND	Signal Ground
12	RX-	Receive -
13	+12	+12 volts
14	GND	Signal Ground
15	NC	No connection
Shell		Chassis Ground

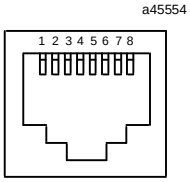


Figure A-2. 10BaseT (MAU MDI) Port Connector Configuration

Table A-2. Pinout Listing for the 10BaseT (MAU MDI) Port

Pin No.	Signal	Description
1	TD+	Transmit Data +
2	TD-	Transmit Data -
3	RD+	Receive Data +
4	NC	no connection
5	NC	no connection
6	RD-	Receive Data -
7	NC	no connection
8	NC	no connection

Coaxial BNC Ethernet

The Display Station can communicate to thin-wire coaxial TCP/IP Ethernet Interface by using an AUI to BNC transceiver. An AUI to BNC transceiver, IC751BET000 (includes AUI cable) can be purchased GE Fanuc.

Note

Some transceivers contain washers or springs under their locking posts. With these washers or springs in place, the transceiver will not seat well in the AUI connector while it is latched. Washers or springs should be removed from transceiver locking posts before installing the transceiver.

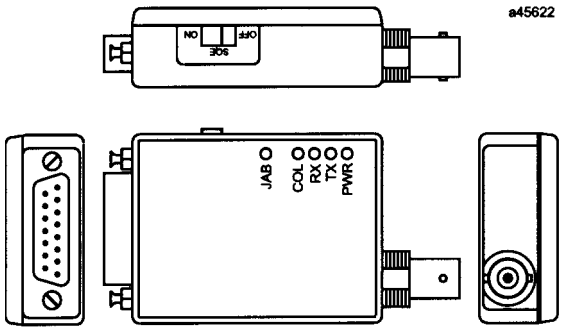
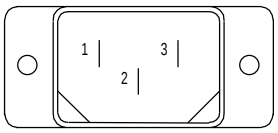


Figure A-3. AUI to BNC Transceiver

AC Power

The Display Station has a three-prong AC power receptacle for input power, located on the back panel of the unit. The Display Station requires 90 to 265 VAC at 47 to 63 Hz. For complete input power specifications, refer to Appendix F.



Pin No.	Signal Name
1	neutral
2	ground
3	hot

External Display

The external VGA display port is a high-density 15-pin, female, D-type connector, shown in Figure A-4. Refer to "External Display" in Chapter 6 for information and recommendations concerning the configuration of this option.

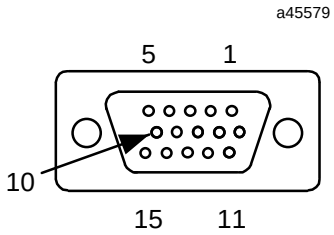


Figure A-4. External Display Port

Table A-3. Pinout Listing for the External Display Port

Pin No.	Signal Name
1	Red Analog
2	Green Analog
3	Blue Analog
4	no connection
5	Ground
6	Ground Analog
7	Ground Analog
8	Ground Analog
9	no connection
10	Ground
11	no connection
12	no connection
13	Horizontal Synch
14	Vertical Synch
15	no connection

External Keyboard

The external keyboard port, shown in Figure A-5, is a 6-pin, female DIN-type connector.

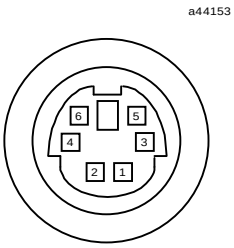


Figure A-5. External Keyboard Port

Table A-4. Pinout Listing for the Keyboard Port

Pin No.	Signal Name
1	Data
2	no connection
3	Ground
4	+5VDC
5	Clock
6	no connection

Serial Port 2 (COM2)

The Display Station System RS-422/232 serial port (COM2) is a 25-pin D-type male connector. Because this connector has been defined as a dual function connector, standard 25 pin serial devices might not work with this connector. You must create a custom cable to assure that the external device will function properly with this port.

The RS-422/232 port is set for RS-422 operation at the factory. On the Display Station's system board, jumper J23 is used to select RS-232, RS-422, or RS-485 operation. Because the RS-485 setting requires a two wire arrangement, it is not recommended for use with GE Fanuc PLC products. Please refer to "Changing the Serial Port 2 Configuration" for more details.

COM2 is normally connected to a GE Fanuc PLC using RS-422. It is *not* recommended that this setting be changed.

Connector Layout

Figure A-6 shows the serial port connector layout. Table A-5 lists the pin numbering and signal assignments for the connector.

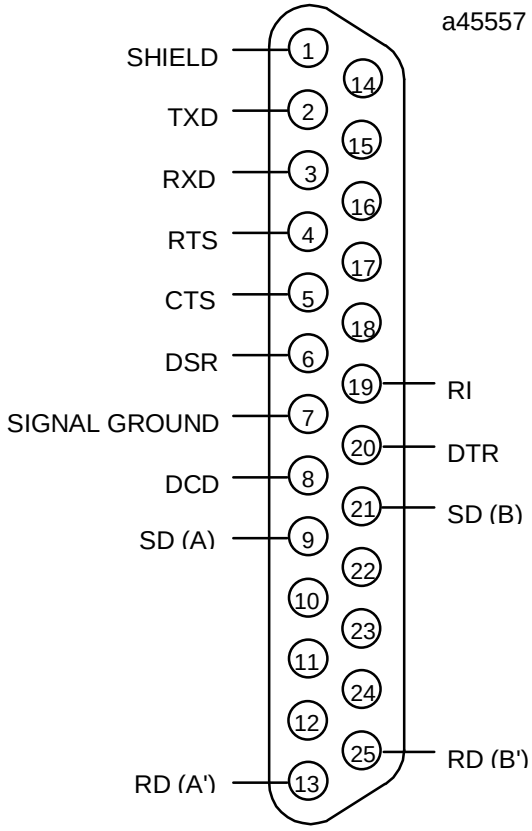


Figure A-6. Serial Port 2 (RS-422/232)

Table A-5. Pinout Listing for Serial Port 2

Pin No.	I/O	Description	Pin No.	I/O	Description
1	-	SHIELD	14	-	no connection
2	O	TxD, Transmit Data	15	-	no connection
3	I	RxD, Receive Data	16	-	no connection
4	O	RTS, Request To Send	17	-	no connection
5	I	CTS, Clear To Send	18	-	no connection
6	I	DSR, Data Set Ready	19	I	RI, Ring Indicate
7		GND, signal ground	20	O	DTR, Data Terminal Ready
8	I	DCD, Data Carry Detect	21	O	SD(B)
9	O	SD(A)	22	-	no connection
10	-	no connection	23	-	no connection
11	-	no connection	24	-	no connection
12	-	no connection	25	I	RD(B')
13	I	RD(A')			

Changing the Serial Port 2 Configuration (Touch Display Units Only)

The secondary serial port (COM2) on the Display Station system board can be configured to operate in RS-232, RS-422, or RS-485 mode. The board is configured at the factory to operate in RS-422 mode. You can change this configuration by changing the setting of a six-pin jumper, J23, on the system board. Figure A-7 shows the locations and default settings of all the jumpers for reference purposes. However, *J23 is the only jumper setting that can be changed*. All other jumpers must remain at their default settings.

Caution

This procedure should be performed in a clean, dust-free environment.

Caution

Do not change any jumpers other than J23. If you change other jumpers, your Display Station may not work.

Caution

This procedure is not recommended for Touch Station and Glide Station units. Attempting to remove the ISA port could damage pins on the CPU board.

Table A-6. Mode Selection

	Jumper Pins			
Mode	**1-2**	**3-4**	**5-6**	
RS-232	!	#	#	Optional
RS-422	#	!	#	Default
RS-485	#	#	!	***Not recommended for connections to GE Fanuc PLCs***

! = closed # = open

The interrupt request (IRQ) and address range for the serial ports do not need to be changed for normal operation. However if you want to disable the port or change these parameters, you can do so in the system BIOS setup. (See Appendix B.) The table below shows the settings for the serial ports.

Table A-7. Serial Port Default Settings

Port	Address Range	Interrupt	Default Setting
COM1	2E8—3F8	IRQ4	3F8
COM2	2E8—3F8	IRQ3	2F8

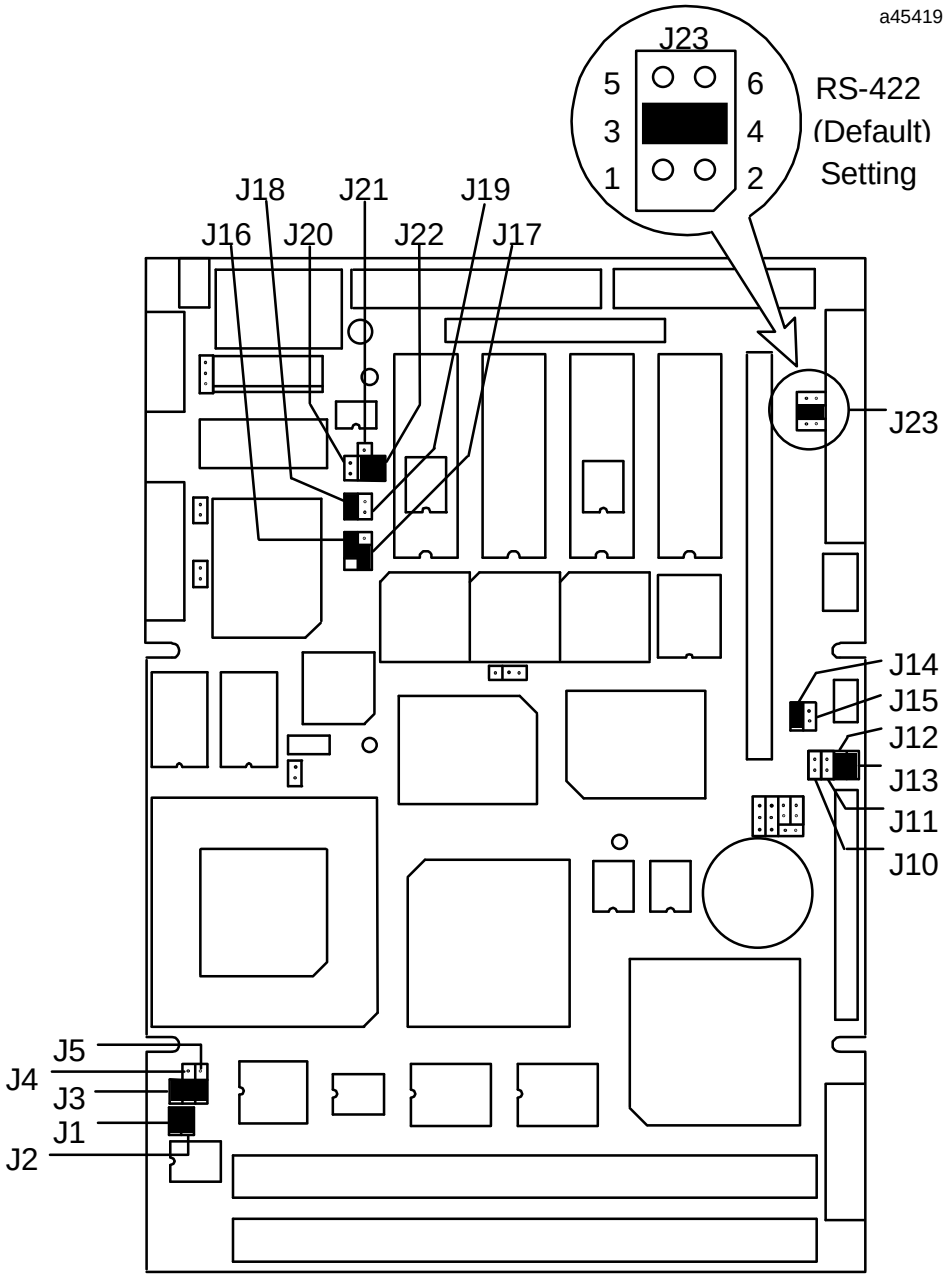


Figure A-7. Default Settings for System Board Jumpers

Serial Port 1 (COM1)

Note

In Display Station products that have a touch screen and run Windows NT (IC751ATS350 and IC751BTS350), the COM 1 port is used for the touch screen and is not available to connect other devices.

The RS-232 serial port is a 9-pin D-type male connector. Figure A-8 shows the serial port connector layout. Table A-6 lists the pin numbering and signal assignments for the connector.

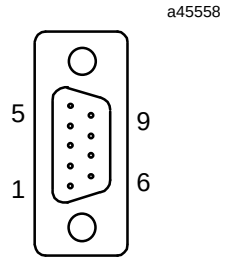


Figure A-8. Serial Port 1 (RS-232)

Table A-8. Pinout Listing for RS-232 Serial Port

Pin No.	I/O	Description	
1	I	DCD	Data Carrier Detect
2	I	RXD	Receive Data
3	O	TXD	Transmit Data
4	O	DTR	Data Terminal Ready
5	—	GND	Signal Ground
6	I	DSR	Data Set Ready
7	O	RTS	Request to Send
8	I	CTS	Clear to Send
9	I	RI	Ring Indicate

Parallel Port

The parallel port is a 25-pin D-type connector, shown in Figure A-9. Table A-7 lists the pin numbering and signal assignments for the connector. This port can be used for printing, as well as for transferring data from a CD-ROM or between the Display Station and another computer.

For data transfer between the Display Station and another computer, a special parallel cable, IC751CBL001A is recommended. This cable can be ordered from GE Fanuc.

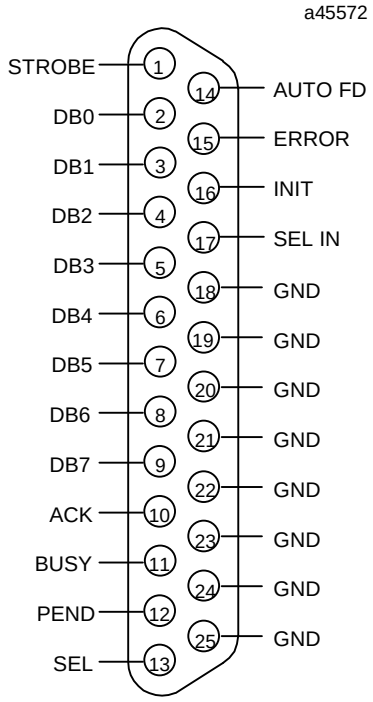


Figure A-9. Parallel (Printer) Port Configuration

Table A-9. Parallel Port Pin Assignments

Pin No.	Description
1	Strobe
2	Data Bit 0
3	Data Bit 0
4	Data Bit 0
5	Data Bit 0
6	Data Bit 0
7	Data Bit 0
8	Data Bit 0
9	Data Bit 0
10	Ack

Pin No.	Description
11	Busy
12	P. End (out of paper)
13	Select
14	Auto Feed
15	Error
16	Initialize Printer
17	Select Input
18—25	Ground

Accessory Port

The accessory port is an 8-pin DIN-type connector, as shown in the figure below. Table A-8 lists pinout assignments for the accessory port.

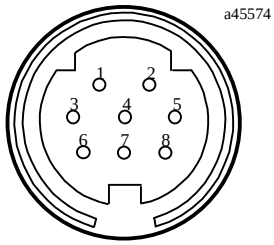


Figure A-10. Accessory Port Configuration

Table A-10. Accessory Port Pinout Listing

Pin No.	Description
1	Reserved
2	Reserved
3	Speaker -
4	Speaker +
5	Watchdog Timer Out
6	GND
7	RESET switch +
8	RESET switch -

Cable Specifications

The cable assembly presents one of the most common causes of communication failure. For best performance, construct cable assemblies according to the recommended connector parts and specifications, listed in the table below.

Note

To comply with FCC regulations and CE mark requirements, shielded cables must be used for all connections to the Display Station.

Table A-11. Recommended Cables and Connectors

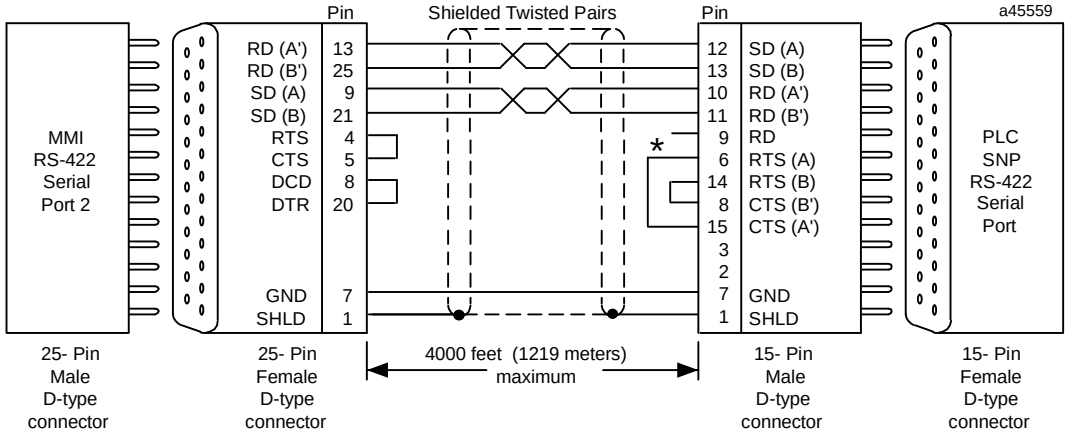
Item	Description
Mating Connector	Serial (RS-232 port): 9-pin female, D-Subminiature Type Serial (RS-422/232 port): 25-pin female, D-Subminiature Type Parallel (printer) Port: 25-pin male, D-Subminiature Type
Cable	24 AWG (0.22 mm^2) minimum — Overall shield Maximum length for data rates up to 19.2 bits per second: RS-232: 50 feet (15 meters) RS-422: 4000 feet (1219 meters)

Cable Diagrams

Serial Port 2 (RS-422/232)

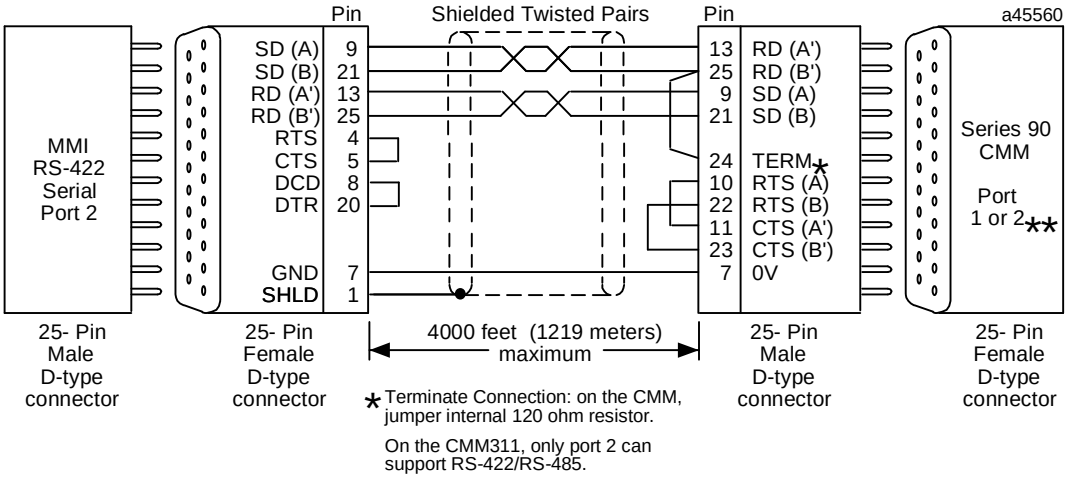
The Display Station System RS-422/232 serial port (COM2) is a 25-pin D-type male connector. This port is configured at the factory for RS-422 communications.

The Display Station can communicate, using Series 90 Protocol (SNP), directly to the RS-422/485 port in the Series 90-30 and Series 90-70 PLCs, or to a Communications Coprocessor Module (CMM). This eliminates the need for a special RS-422/485 to RS-232 converter. See the figures below for details.



* Termination resistance for the receive data (RD) signal must be connected only on units at the end of the This termination is made on the Series 90 PLC products by connecting a jumper between Pin 9 and inside the 15-pin D-shell with the following
For Series 90-70 PLCs, catalog numbers IC697CPU731 and IC697CPU771, the RD at the PLC is implemented by a jumper between Pin 9 and

Figure A-11. Display Station RS-422 Host to PLC Connection (no handshaking)



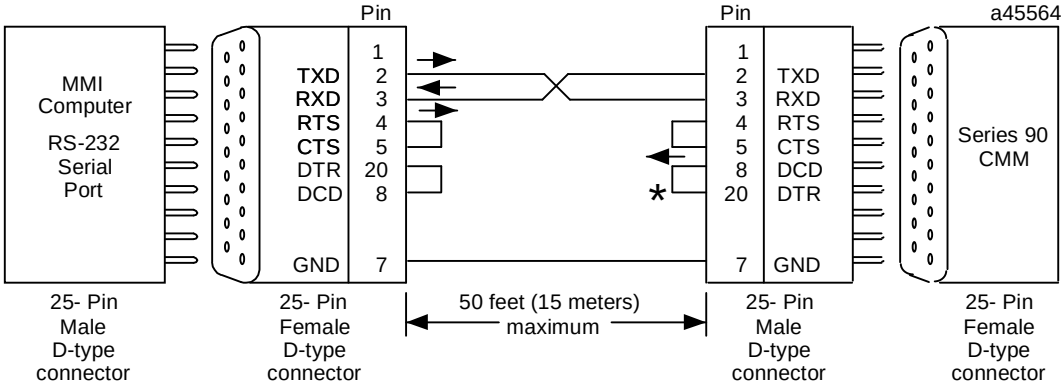
* Terminate Connection: on the CMM, jumper internal 120 ohm resistor.

On the CMM311, only port 2 can support RS-422/RS-485.

Figure A-12. Display Station to CMM without Flow Control (RS-422/RS-485)

Serial Port 2 (Configured for RS-232)

GE Fanuc recommends using RS-422 to communicate to the PLC because the cable can be as long as 4000 feet (1219 meters). GE Fanuc does not recommend changing the jumper on serial port 2 to RS-232 for communicating to the communication module because the cable length can only be 50 feet (15 meters) maximum. However, if your application requires RS-232 to communicate to the PLC, the wiring diagram is shown in Figure A-13.



* Jumper required for CCM interface (versions prior to "C")

Figure A-13. RS-232 Serial Port to CMM Interface without Flow Control

Serial Port 1 (RS-232)

Note

In Display Station products that have a touch screen and run Windows NT (IC751ATS350 and IC751BTS350), the COM 1 port is used for the touch screen and is not available to connect other devices.

Serial port 1 (COM1) is a 9-pin D-type connector that is primarily intended for temporary use by an external device such as a mouse or modem. GE Fanuc recommends using serial port 2 for communicating with the PLC because it is configured for RS-422, which allows longer cables (up to 4000 feet — 1219 meters). However, if you want to connect the Display Station to the CMM module using Serial Port 1, the cable wiring diagrams are provided in the figures below.

Figure A-14 shows the Display Station RS-232 serial port connection to the PLC Communications Coprocessor Module (CMM).

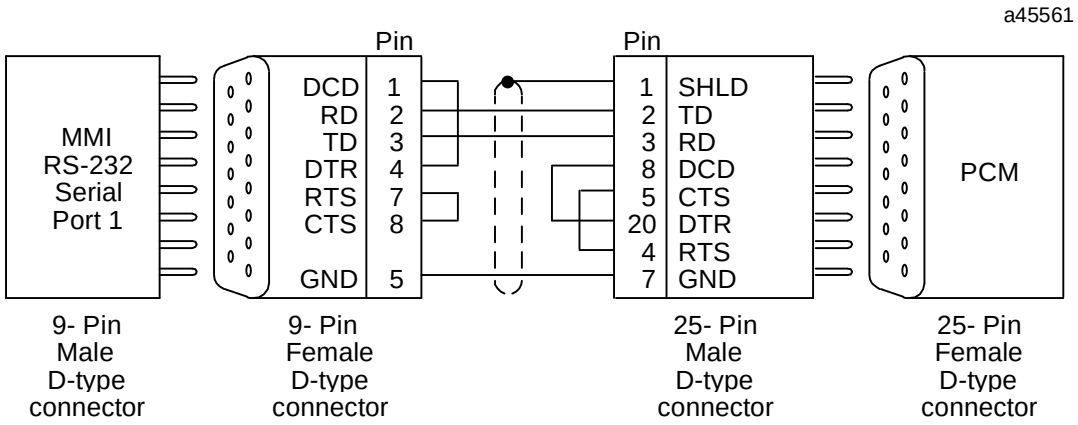


Figure A-14. PCM, ADC, or CMM to Display Station without Flow Control

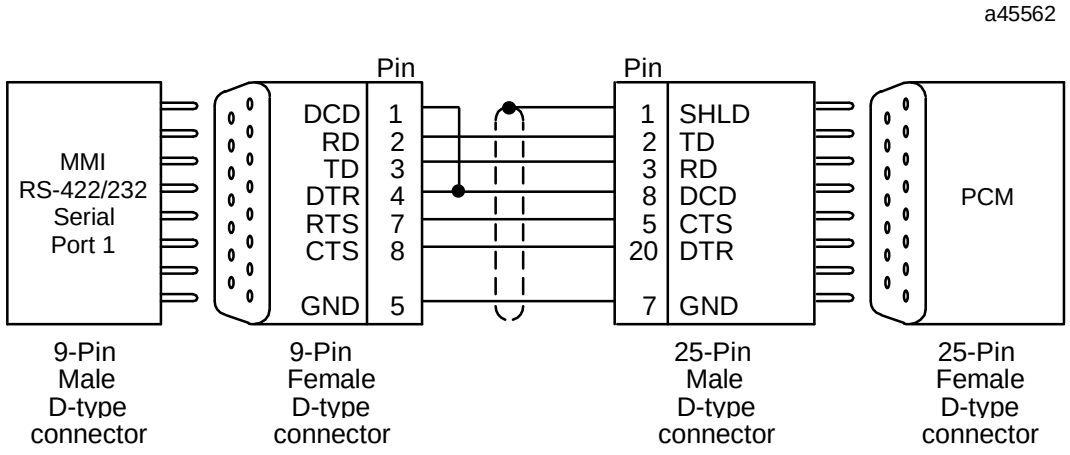


Figure A-15. PCM, ADC, or CMM to Display Station with Flow Control

Connecting to a PLC Directly Through Serial Port 1

To use this configuration, you must purchase a special RS-422 to RS-232 Converter (IC690ACC900) or Miniconverter Kit (IC690ACC901) through GE Fanuc. The Converter and Miniconverter Kit are described on page A-19.

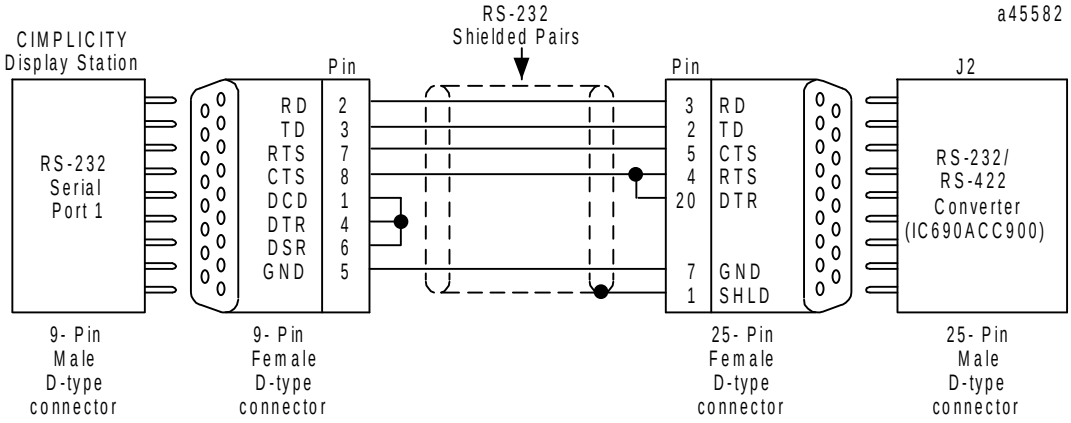


Figure A-16. Display Station to RS-232 Converter

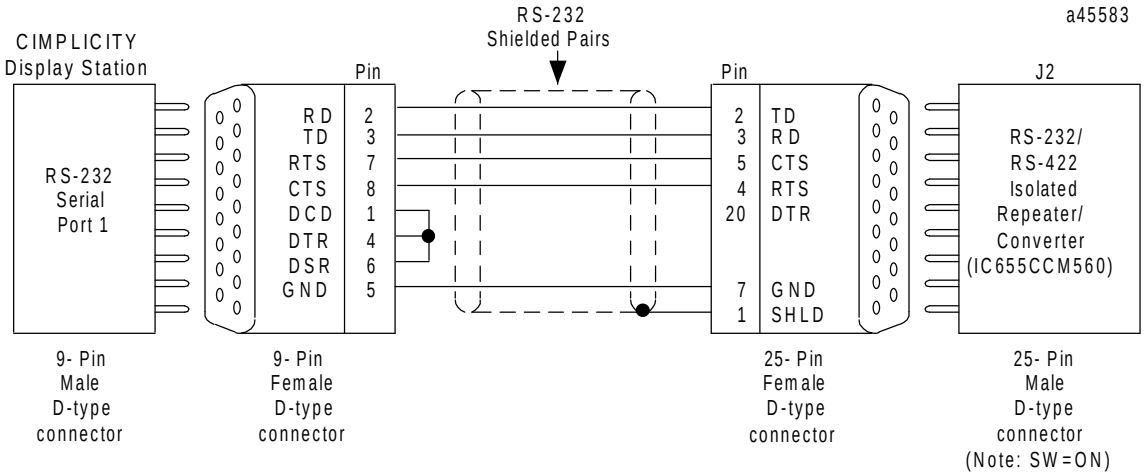
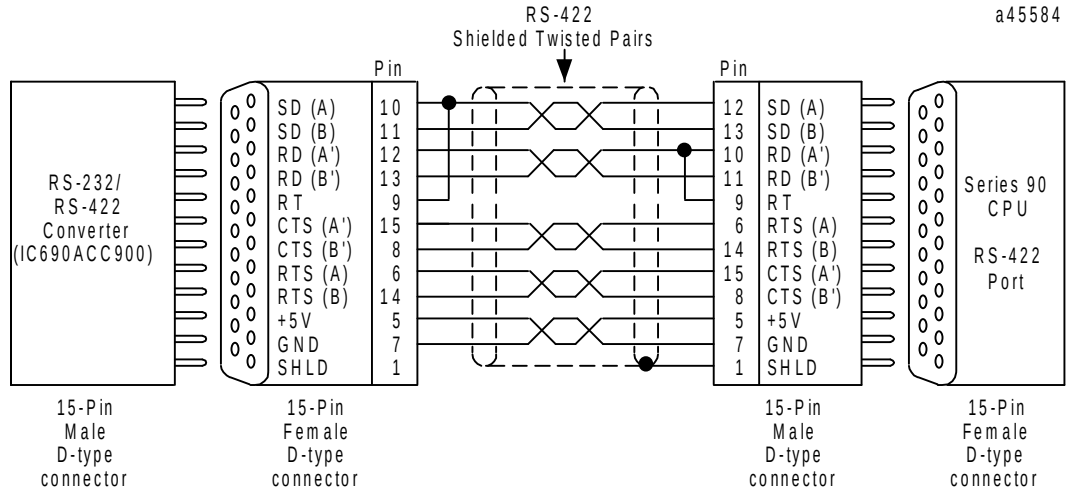
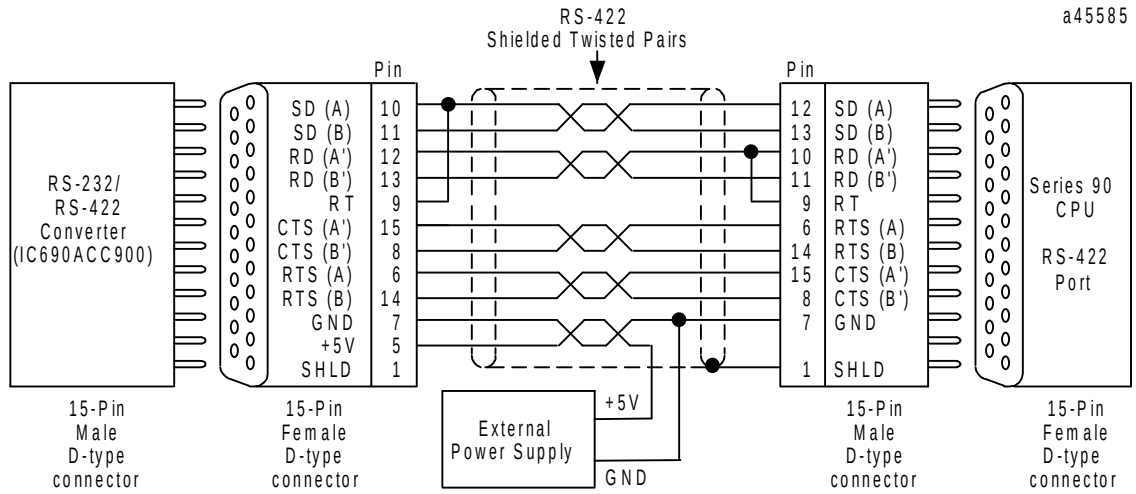


Figure A-17. Display Station to RS-422/RS-232 Isolated Repeater/Converter



For all Series 90 PLCs, except the the following Series 90-70s:
Catalog Number IC697CPU771
Catalog Number IC697CPU731

Figure A-18. RS-232 Converter to Series 90 CPU Point-to-Point



For all Series 90 PLCs, except the the following Series 90-70s:
Catalog Number IC697CPU771
Catalog Number IC697CPU731

Figure A-19. RS-232 Converter to Series 90 CPU Point-to-Point (External Supply Required)

RS-422/RS-485 to RS-232 Converter

The RS-422/RS-485 to RS-232 Converter (IC690ACC900) provides an RS-232 interface to external devices requiring the RS-232 serial interface through conversion of the RS-422/RS-485 signals provided at the RS-422/RS-485 ports in the Series 90-30 PLC. This converter provides a direct serial connection to the *standard serial COM* port of the host computer used as the programming device for the Series 90-30 PLC.

This converter is a small, convenient, self-contained device which requires only a cable connection to the Series 90-30 RS-422/RS-485 port on one end and a cable connection to the RS-232 device on the opposite end.

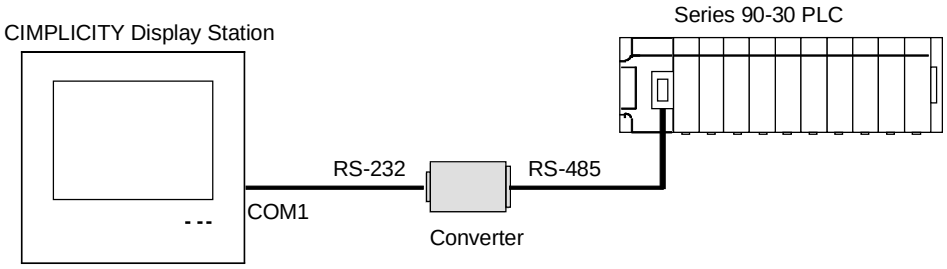


Figure A-20. Example: RS-422/RS-485 to RS-232 Converter in a Series 90 PLC System

The converter operates from a +5 VDC source, which is provided from the PLC backplane +5 VDC bus, through the cable connection. The pin assignments for the connections on the cable required for the RS-232 connection are compatible with available Programmable Coprocessor Module (PCM) compatible serial cables (IC690CBL702, PCM to PC-AT). The RS-422/RS-485 connection at the Series 90-30 serial port on the power supply can be made with an available cable (same cable that is used with the Hand-held Programmer), IC693CBL303.

The three PCM compatible cables (IC690CBL701/702/705) are 10 feet (3 meters) in length, and the Hand-Held Programmer compatible cable (IC693CBL303) is 6 feet (2 meters) in length.

An Isolated Repeater/Converter (IC655CCM590) is also available for applications requiring ground isolation where a common ground cannot be established between components, or to boost signal levels for greater distances or to add more drops. For detailed information, refer to the documentation for your Series 90 PLC.

Miniconverter Kit

The Miniconverter Kit (IC690ACC901) consists of an RS-422 (SNP) to RS-232 Miniconverter, a 6 foot (2 meter) serial extension cable, and a 9-pin to 25-pin Converter Plug assembly. The 15-pin SNP port connector on the Miniconverter plugs directly into the serial port connector on the Series 90-30 power supply, Series 90-70 CPU or Series 90-20 CPU. The 9-pin RS-232 port connector on the Miniconverter connects to an RS-232 compatible device.

When used with an IBM PC-AT, or compatible computer, one end of the extension cable plugs into the Miniconverter's 9-pin serial port connector, the other end plugs into the 9-pin serial port of the computer. The Converter plug (supplied with kit) is required to convert the 9-pin serial port connector on the Miniconverter to the 25-pin serial port connector on the Display Station.

The Miniconverter is shown in the following figure. For more information on the Miniconverter, refer to the documentation for your Series 90 PLC.

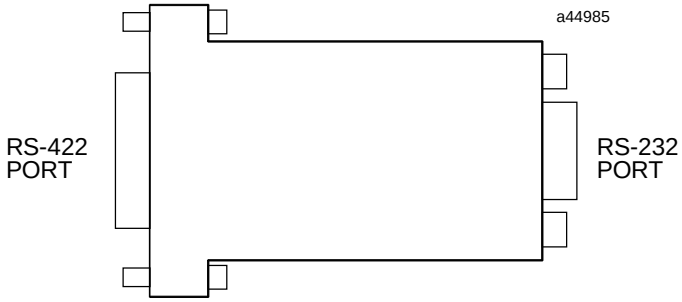


Figure A-21. Series 90 SNP Port to RS-232 Adapter

Communications Coprocessor Module Interface

The Communications Coprocessor Module (CMM) is a dedicated communications module. Because the Series 90-70 CMM (IC697CMM711) and the Series 90-30 CMM (IC697CMM311) are very similar in operation, the cable diagram shown in Figure A-15 is used for both.

The CMM port configuration is a 25-pin D-type female connector.

Appendix B Computer Setup

This appendix provides listings of the default settings as the CIMPLICITY Display Station is configured at the factory. In addition, instructions for infrequently performed computer setup tasks are provided.

Note

Refer to the datasheet provided with your Display Station before reading this appendix. Information provided by the datasheet supersedes information in this appendix.

- Default Settings B-2
  - Standard CMOS Setup B-2
  - BIOS Features Setup B-4
  - CHIPSET Features Setup B-6
- Load BIOS Defaults B-7
- Changing the Default Boot Sequence B-8
- Setting and Changing Passwords B-8
- Using the Auto Detect Hard Disk Utility B-10
- Save & Exit Setup B-10
- Exit Without Saving B-10

Default Settings

It is normally not necessary to change the settings in the computer setup files. If settings become corrupted, restore them to the defaults shown on the datasheet provided with your Display Station product and in this Appendix. ***Information provided by the datasheet supersedes information in this chapter.***

Most of the computer setup information can be invoked by pressing the **DEL** key during the computer power up sequence (you will be prompted during power up to press the **DEL** key). This setup program is built into the Award™ BIOS ROM. Upon invoking setup, the screen shown in Figure B-1 will appear. Note that the bottom line of the screen contains online help information for the option that is selected (highlighted). Also, key functions for the screen are defined in the block that is directly above the online help line.

```
                ROM/ISA BIOS (214L2AK1)
                CMOS SETUP UTILITY
                AWARD SOFTWARE, INC.

STANDARD CMOS SETUP              PASSWORD SETTING

BIOS FEATURES SETUP              IDE HDD AUTO DETECTION

CHIPSET FEATURES SETUP           SAVE & EXIT SETUP

LOAD BIOS DEFAULTS               EXIT WITHOUT SAVING

ESC:QUIT                         ↓ → ↑ ←
F10:Save and Exit Setup          (Shift) F2:Change Color

                Time, Date, Hard Disk Type ....
```

Figure B-1. Initial Setup Menu

Standard CMOS Setup

To set the time and date, choose the STANDARD CMOS SETUP option from the initial setup menu. The screen shown in Figure B-2 will be displayed. *Set the date and time only. Do not* change any other default settings.

Settings for your system will be different. Refer to the enclosed datasheet for your hard drive size.

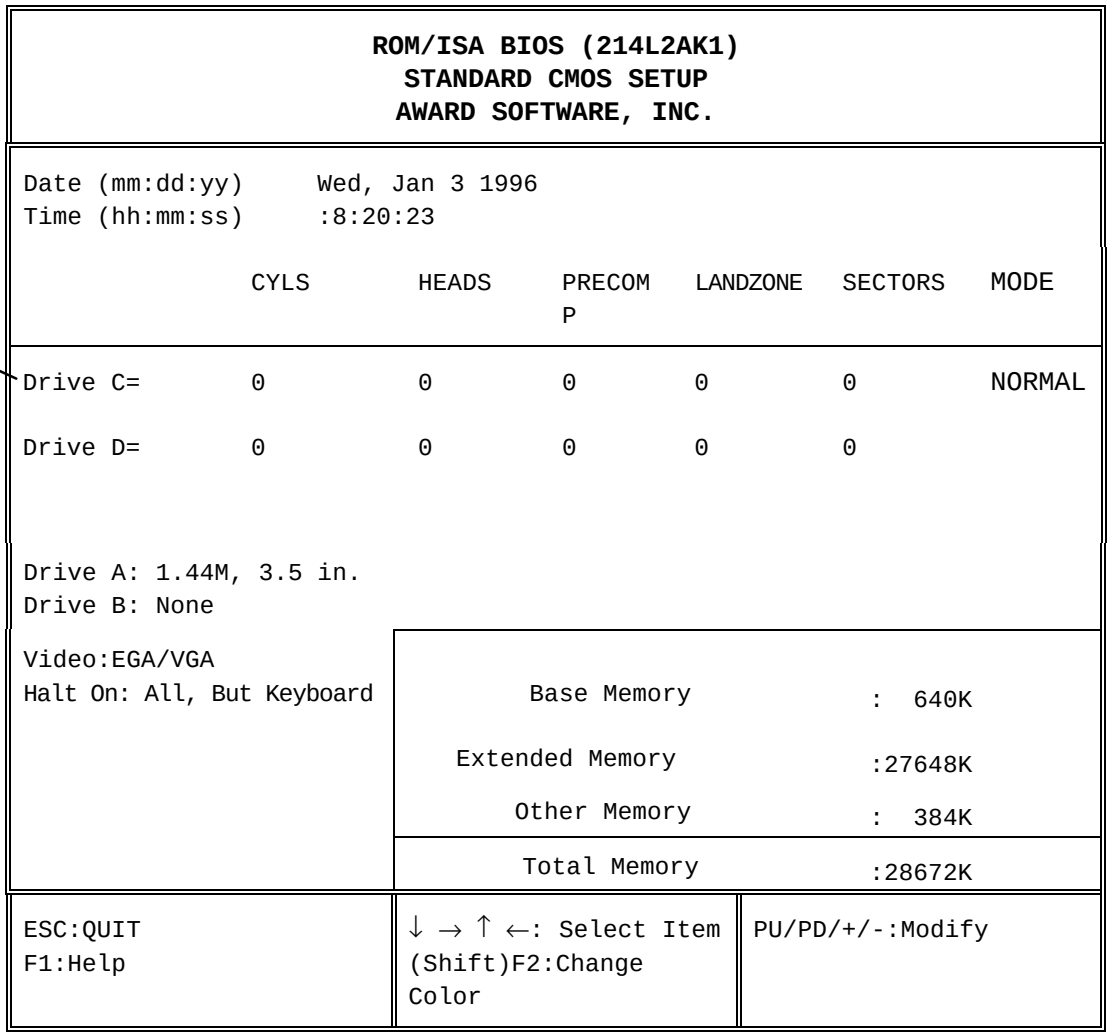


Figure B-2. CMOS Setup Screen

BIOS Features Setup

When you select the BIOS FEATURES SETUP option from the initial setup screen menu, the screen shown in Figure B-3 is displayed. Changing these settings is not recommended.

Refer to the datasheet provided with your Display Station for the correct settings. Information provided by the datasheet supersedes information in this appendix.

ROM/ISA BIOS (214L2AK1)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	:Disabled	Video BIOS Shadow	:Enabled
CPU Internal Cache	:Enabled	C8000-CBFFF Shadow	:Enabled
Quick Power On Self Test	:Enabled	CC000-CFFFF Shadow	:Enabled
Boot Sequence	:A,C	D0000-D3FFF Shadow	:Disabled
Swap Floppy Drive	:Disabled	D4000-D7FFF Shadow	:Disabled
Boot Up Floppy Seek	:Enabled	D8000-DBFFF Shadow	:Disabled
Boot Up NumLock Status	:On	DC000-DFFFF Shadow	:Disabled
Boot Up System Speed	:High	E0000-E3FFF Shadow	:Disabled
IDE HDD Block Mode	:Enabled	E4000-E7FFF Shadow	:Disabled
Gate A20 Option	:Fast	E8000-EBFFF Shadow	:Disabled
Memory Parity Check	:Disabled	EC000-EFFFF Shadow	:Disabled
Typematic Rate Setting	:Disabled		
Typematic Rate Setting	:6	Esc: Quit F1:Help	↓→↑←:Select Item PU/PD/+/-:Modify
Typematic Delay (Msec)	:250	F5:Old Values F6:Load BIOS Defaults	(Shift) F2:Color
Security Option	:Setup	F7:Load Setup Defaults	

Figure B-3. BIOS Features Default Settings

CHIPSET Features Setup

When you select the CHIPSET FEATURES SETUP option from the initial setup screen menu, the screen shown in Figure B-4 is displayed. Do not change these default settings.

Refer to the datasheet provided with your Display Station for the correct settings. Information provided by the datasheet supersedes information in this appendix.

ROM/ISA BIOS (214L2AK1)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Decoupled Refresh	Enabled	Onboard FDC Controller	Enabled
Relocate 256k/384k	Disabled	Onboard IDE Controller	Enabled
Memory Hole At 15Mb Addr.	Disabled	Onboard Serial Port 1	COM1(3F8h)
DRAM Timing Control	Fast	Onboard Serial Port 2	COM2(2F8h)
Fast DRAM	Enabled	COM3 & COM4 Address	3E8H,2E8H
486 Streaming	Enabled	Onboard Parallel Port	378H
		Onboard Parallel Mode	Printer
		Solid State Disk	Disabled
		Esc: Quit	↓→↑←:Select Item
		F1:Help	PU/PD/+/-:Modify
		F5:Old Values	(Shift) F2:Color
		F6:Load BIOS Defaults	
		F7:Load Setup Defaults	

Figure B-4. Chipset Features Default

Loading BIOS Defaults

The LOAD BIOS DEFAULTS option loads the default system values directly from ROM, *which are not the same as the values recommended by GE Fanuc*. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the PCM-4860 on.

Caution

Do not use this option. BIOS settings must be restored to the values provided on the datasheet provided with your Display Station.

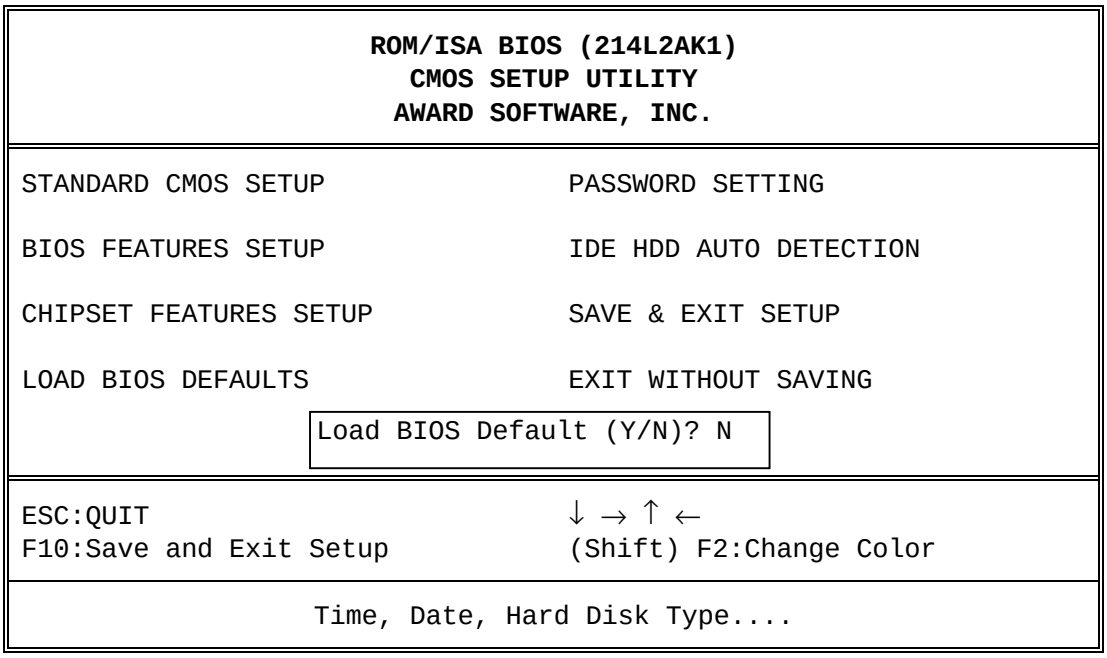


Figure B-5. Load BIOS Defaults Screen

Changing the Default Boot Sequence

The Display Station can be set up to boot from the hard disk instead of the floppy disk. The default boot sequence is changed by editing the BIOS Features Setup default settings, shown on page B-4 To make this change, perform the following steps:

1. When prompted during the power on self test, press the **DEL** key. The CMOS SETUP UTILITY main menu will appear.
2. Press the down (↓) cursor key to select BIOS FEATURES SETUP and press **ENTER**. The BIOS FEATURES SETUP screen will appear.
3. Press the ↓ cursor key to select the Boot Sequence parameter.
4. Press the **PAGE UP** or **PAGE DOWN** key to change the setting to C, A.
5. Press the **ESC** (Cancel) key to return to the CMOS Setup Utility main menu.
6. Press the ↓ cursor key to select the SAVE & EXIT SETUP option.
7. When prompted, press **SHIFT** + **F9** (for Yes) and then press **ENTER**.

Setting and Changing the Setup Password

This password protects the BIOS settings. To set a network password, see “Passwords” in the index.

Note

A keyboard is required to set a password. If you select the System setting, a keyboard will be required for powerup. For Touch Display systems, connect a PS/2 keyboard to the KEYBD connector.

To change the BIOS settings password, choose the PASSWORD SETTING option from the CMOS SETUP UTILITY main menu and press **ENTER**. To enable this feature, you must first set the Security Option in the BIOS FEATURES SETUP to either Setup or System. The default is set to *Setup*, which protects setup information from being accessed without typing the password.

When PASSWORD SETTING is set to *System*, the password must be entered every time the unit is cold booted, or when you want to change the setup information. GE Fanuc chose to use the *Setup* option as the default because this will protect your setup information from being changed by the operator. The system will power up normally. However, if you use the System setting, the password, which will be the same for setup, must be entered during powerup. The operator may be required to know the powerup password in case of a power outage. Thus, the operator would also know the password to change the setup. You must decide which security method is best for you.

8. If the CMOS is bad, or if this option has never been used, a default password is stored in the ROM. The screen will display the following message:

   ```
   Enter Password:
   ```

   Press the **ENTER** key and continue to change the password.

9. If the CMOS is good, or if this option has been used to change the default password, you will be prompted for the password stored in the CMOS. The screen will display the following message:

   Confirm Password:

   Type the correct password and continue to change the password.

10. After pressing the Enter key (ROM password) or current password (user-defined password), you can change the password stored in the CMOS. The password can be no more than eight characters long.

11. Be sure to record the password and put it in a secure place.

Note

If the operator who set the password forgets it, the password can be cleared by changing a jumper inside the Display Station unit. *Contact GE Fanuc for details and assistance.*

Disabling the Setup Password

To disable the password:

1. Press the Del key when prompted during the power on self test and then enter the password. The CMOS SETUP UTILITY main menu will appear.
2. Press the down (↓) cursor key to select the PASSWORD SETTING option and press **ENTER**.
3. When prompted to enter a password, press the **ENTER** key. This disables the password.
4. Press **ESC** (Cancel) to return to the main menu.
5. Press the ↓ cursor key to select the SAVE & EXIT SETUP option and press the **ENTER** key.
6. When prompted, press **SHIFT** + **F9** (Yes) and press **ENTER**.

Using the Hard Disk Configuration Utility

This utility (IDE HDD AUTO DETECTION) can detect the IDE hard disk installed in your system. You can use this utility to self-detect and/or correct the hard disk type configuration. To access this utility, choose IDE HDD AUTO DETECTION from the CMOS Setup Utility main menu.

Note

After you run this utility, the hard disk settings should be the same as those listed on the datasheet provided with your Display Station. Information provided by the datasheet supersedes information in this appendix.

These are sample values. Settings for your system may be different.

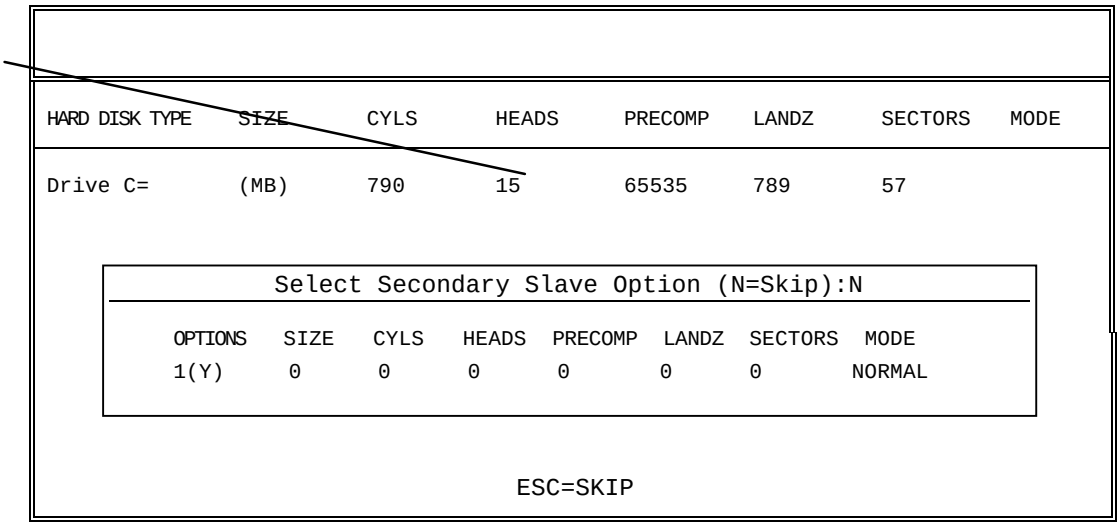

HARD DISK TYPE SIZE CYLS HEADS PRECOMP LANDZ SECTORS MODE
Drive C= (MB) 790 15 65535 789 57
Select Secondary Slave Option (N=Skip):N
OPTIONS SIZE CYLS HEADS PRECOMP LANDZ SECTORS MODE
1(Y) 0 0 0 0 0 0 NORMAL
ESC=SKIP

Figure B-6. Hard Disk Drive Autodetection Utility

Save & Exit Setup

If you select the SAVE & EXIT SETUP option in the initial setup menu and press **ENTER**, the values entered in the setup utilities will be recorded in the CMOS memory of the Chip Set. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

Exit Without Saving

To exit the setup program without changing any values in the setup tables, select this option in the initial setup menu and press the **ENTER** key. This option is useful if you accidentally change a parameter and you don't remember what the default is.

Appendix C

Customizing Network Settings

Your CIMPLICITY Display Station has been configured with networking components that enable you to establish new networks or connect to existing networks easily. If you intend to use Microsoft NetBEUI, TCP/IP, or Direct Cable Connection, some minimal setup changes are required before you can use the system for network applications.

This appendix describes the network components that are installed and configured on your system and provides instructions for making necessary changes to network settings.

- Installed Network Components C-2
- Using Microsoft NetBEUI C-3
- Using TCP/IP Communications C-6
- Setting Up Direct Cable Connection (Windows 95 Systems) C-9

Installed Network Components

Network Component	Comments
NE2000 Adapter	Settings are IRQ 10; I/O address 300-310H. Do not change NE2000 settings.
Dial-Up Adapter	Dial-up Adapter is installed with default settings
TCP/IP	Default settings must be changed before connecting to an existing network. Contact your network administrator for appropriate settings.
NetBEUI	Default settings must be changed before connecting to an existing network. Contact your network administrator for appropriate settings.
System Identification	Computer Name: Each system is uniquely identified and should be renamed before adding it to an existing network Workgroup: The default workgroup is “Workgroup”. This should be renamed before adding it to an existing network.

Default Settings

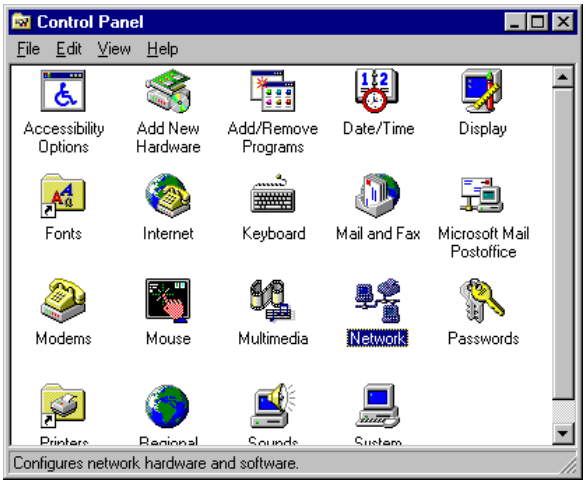
Computer Name:	CIM_MMI
Workgroup:	Workgroup
IP Address:	1.1.1.1
Subnet Mask:	255.255.255.0

Caution

The IP Address must be changed to a unique adress. If it is not changed, conflicts could occur on your network.

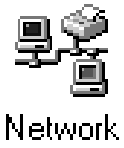
In both Windows 95 and Windows NT systems, these settings must be changed using the Network application in the Control Panel program group.

- In Windows 95 systems, you can access the Control Panel from the Start menu by clicking the Settings icon.
- In Windows NT systems, the Control Panel is accessed from the Main program group.



Using Microsoft NetBEUI

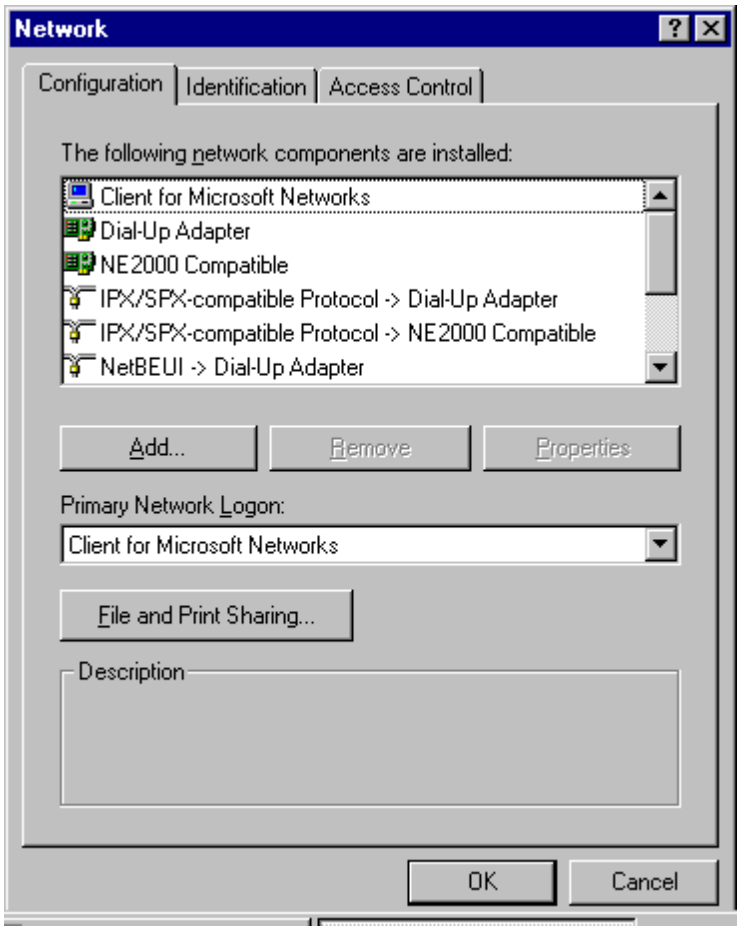
Before using Microsoft NetBEUI to communicate between your Display Station and other systems you should change the System Identification and Workgroup settings. See your network administrator for appropriate values.



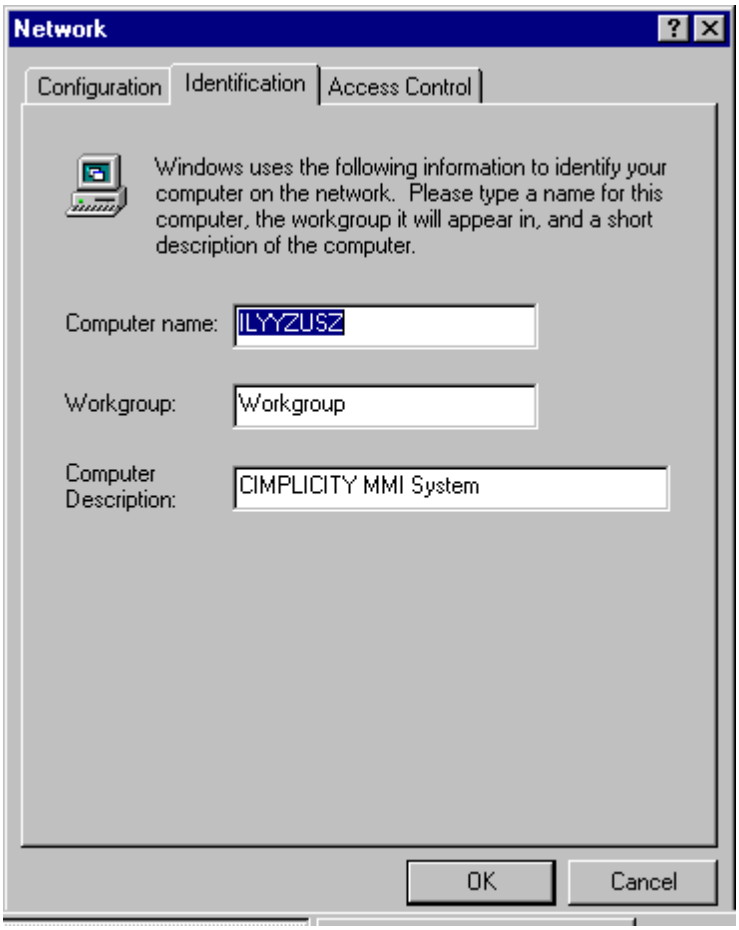
If you have a Windows 95 system, use the procedure below. If your have a Windows NT system, continue on page C-5.

Windows 95 Systems

1. In the Control Panel, click the Network icon. The Network Properties dialog box will be displayed:



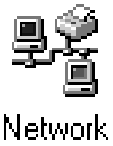
2. Click the Identification tab. The Identification dialog box will be displayed:

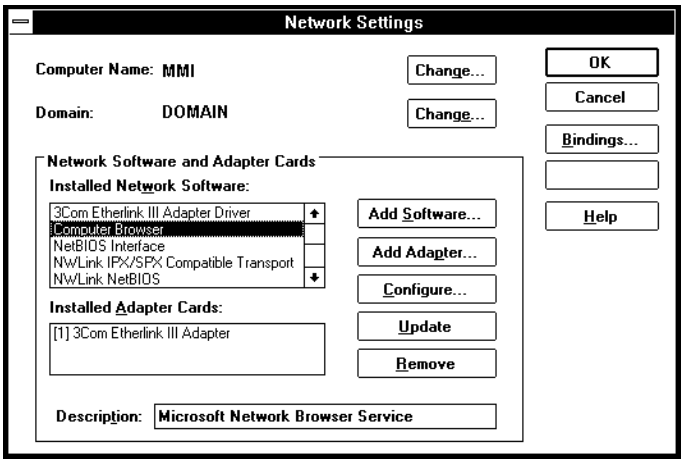


3. Modify the Computer name and Workgroup fields as desired for your installation and click **OK**

Windows NT Systems

1. In the Control Panel, double click the Network icon. The Network Settings dialog box will be displayed:





2. Click the Change ... button for the Computer Name.
3. Modify the Computer Name as needed for your installation.

Using TCP/IP Communications

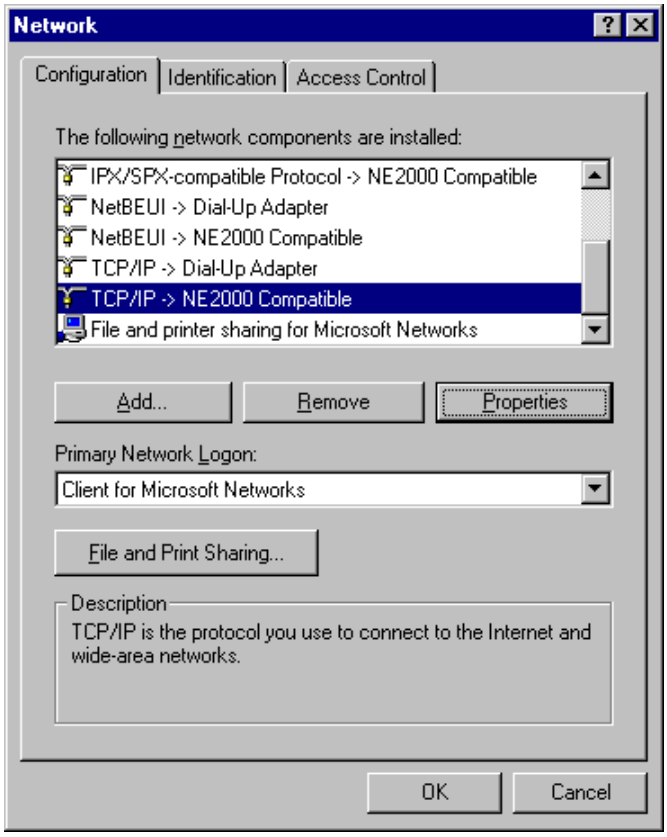
Before using TCP/IP to communicate between your Display Station and GE Fanuc Automation PLCs or other systems, you should change the IP Address and Subnet Mask.

If you have a Windows 95 system, use the procedure below. If you have a Windows NT system, continue on page C-8.

Windows 95 Systems

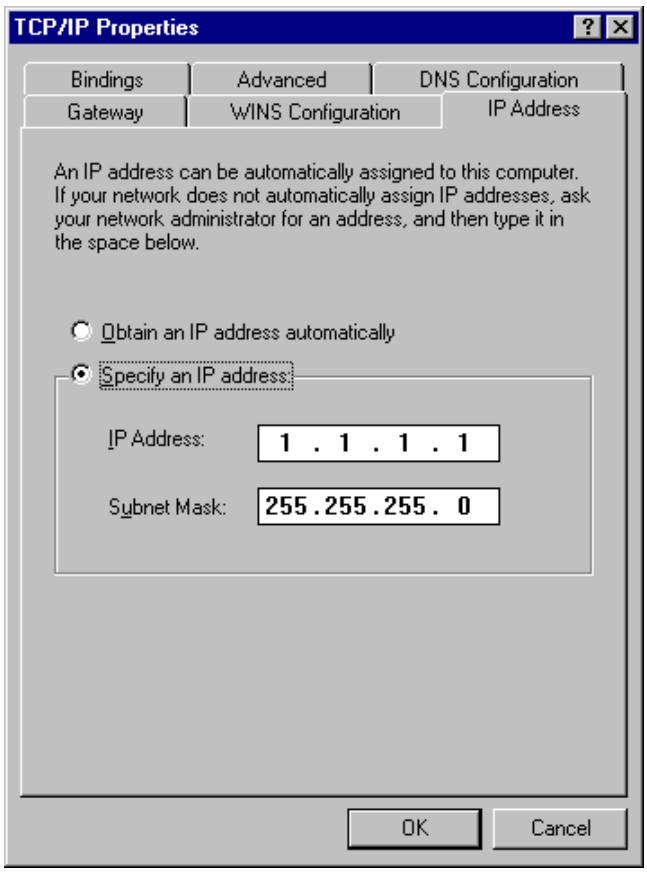
1. In the Control Panel window, click the Network icon.

The Network properties dialog box will be displayed:



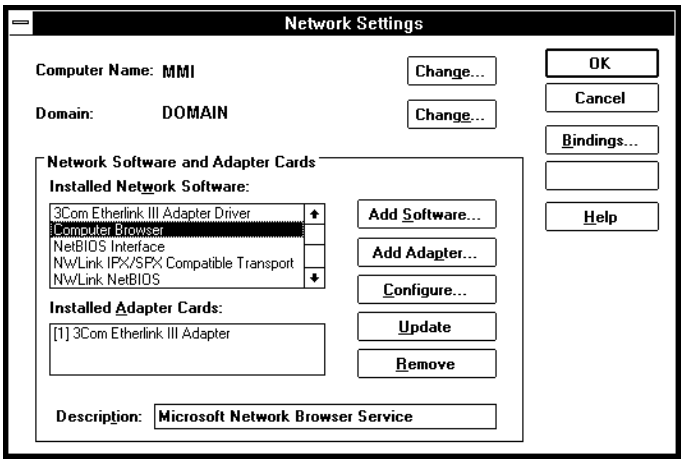
2. Scroll down to and highlight TCP/IP –> NE2000 Compatible, then click Properties.

3. In the TCP/IP Properties dialog box, modify the IP Address and Subnet Mask fields as desired for your installation and click OK.

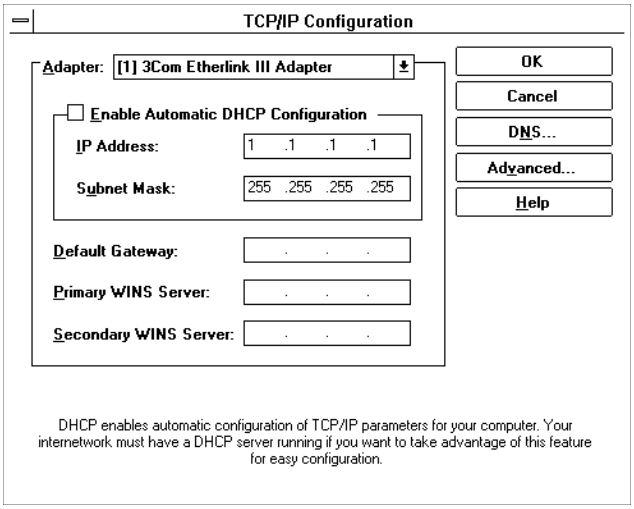

TCP/IP Properties
Bindings
Advanced
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
1 . 1 . 1 . 1
Subnet Mask:
255 . 255 . 255 . 0
OK
Cancel

Windows NT Systems

1. In the Control Panel window, double click the Network icon. The Network Settings dialog box will appear.



2. Select TCP/IP Driver and click Configure ... The TCP/IP Configuration dialog box will appear.


TCP/IP Configuration
Adapter: [1] 3Com Etherlink III Adapter
OK
Cancel
DNS...
Advanced...
Help
Enable Automatic DHCP Configuration
IP Address: 1 .1 .1 .1
Subnet Mask: 255 .255 .255 .255
Default Gateway:
Primary WINS Server:
Secondary WINS Server:
DHCP enables automatic configuration of TCP/IP parameters for your computer. Your internetwork must have a DHCP server running if you want to take advantage of this feature for easy configuration.

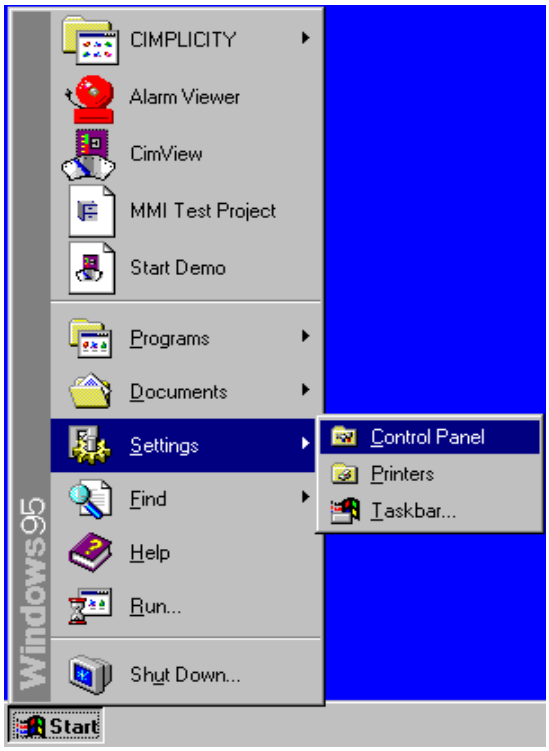
3. Edit the IP Address and Subnet Mask settings as required for your installation.
4. To apply the changes and exit this dialog box, click OK.

Setting Up Direct Cable Connection (Windows 95 Systems)

Setting Up Direct Cable Connection on a CIMPLICITY Development System

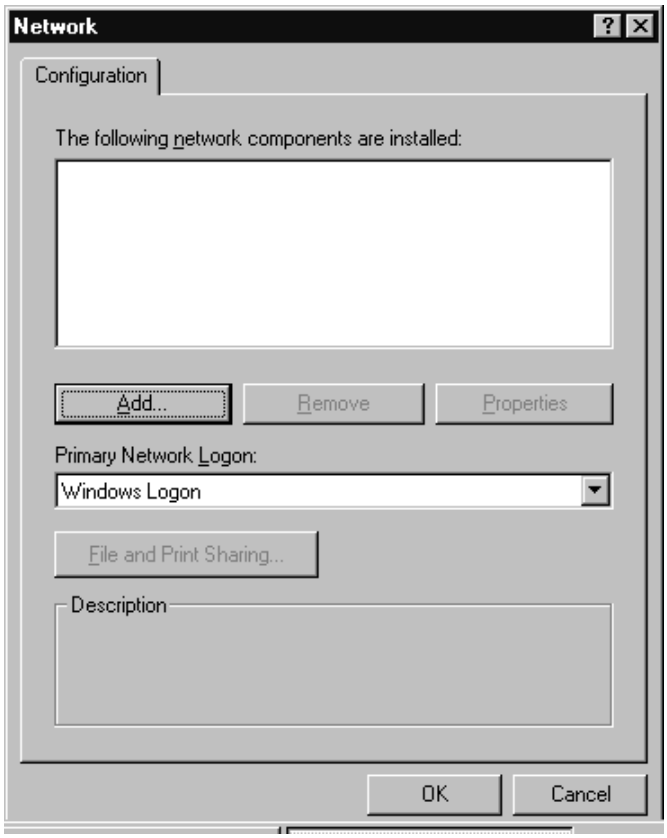
The Windows 95 Direct Cable Connection utility provides a means to establish a network connection between two Windows 95 systems via parallel and serial cables. To copy a project using Ethernet, use the Direct Cable Connection utility on the Display Station. This utility is installed and configured for use on your CIMPLICITY Display Station. This utility is also installed on most laptops running Windows 95. However, it may be necessary to install and configure it on your CIMPLICITY Development System before you can use it to transfer a project to your runtime system.

1. Click the Start button on the task bar, click Settings, and select Control Panel:



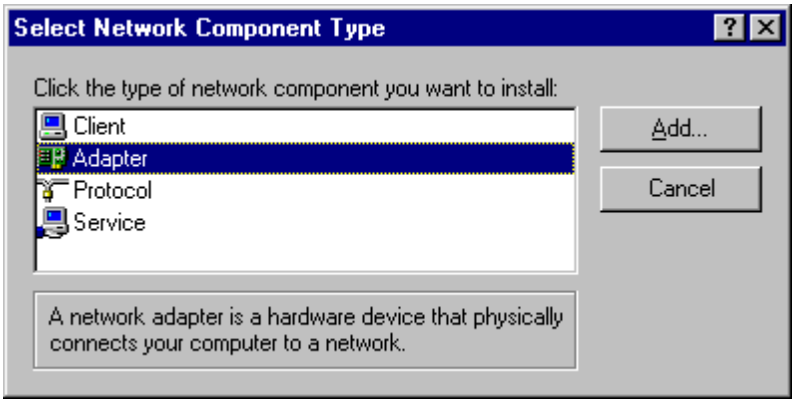
The Control Panel window will be displayed.

2. In the Control Panel window, double click the Network icon to display the Network Configuration dialog box:

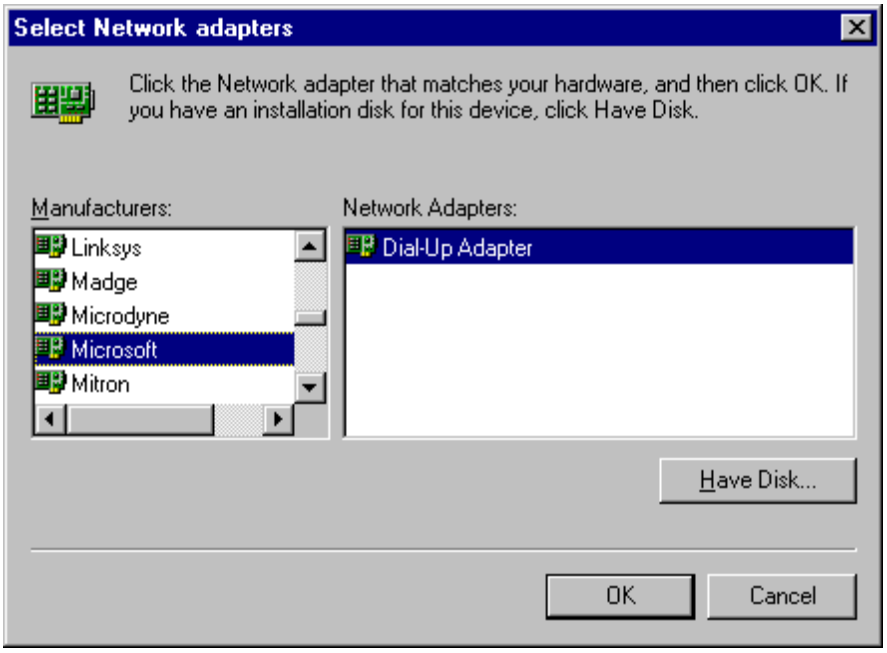


3. If Dial-Up Adapter is listed as one of the network components installed, click Cancel and proceed to page C-12.

4. Click Add... The Select Network Component Type dialog box will be displayed. Select Adapter.



5. Click Add... The Select Network adapters dialog box will be displayed:



6. Scroll down to Microsoft under the Manufacturers column and click Microsoft and Dial-Up Adapter to highlight them. Then click OK.

7. Click OK to save. The software will display the following message;

   ```
   Do you want to restart your computer now?
   ```

8. Click the Windows Start button and click Shutdown in the Start menu.

   The Microsoft Dial-up Adapter is now configured.

Installing Direct Cable Connection in Windows 95

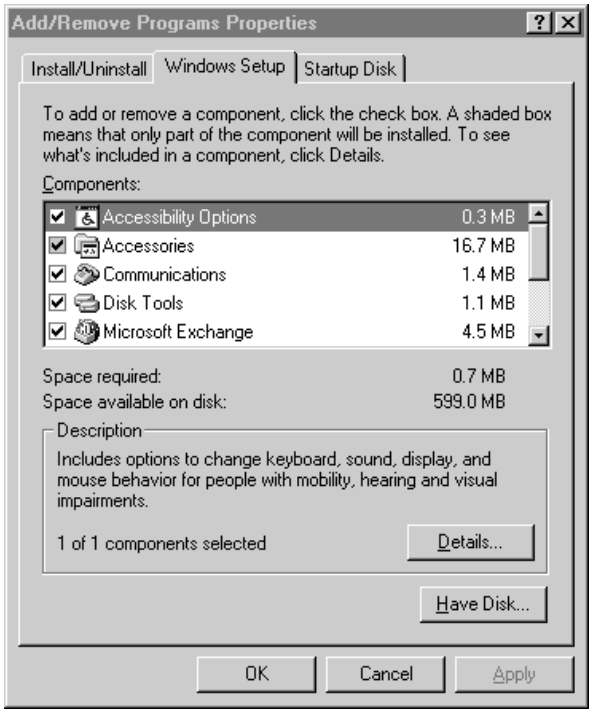
To install Direct Cable Connection on a Windows 95 System:

1. In the Windows 95 Control Panel window, double click the Add/Remove Programs icon.

The Add/Remove Programs dialog box will be displayed:

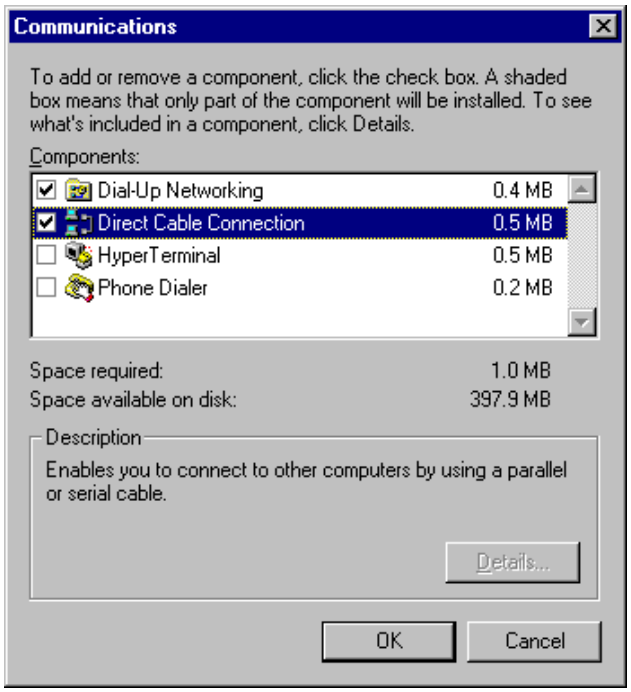
Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
CIMPLICITY System
Add/Remove...
OK
Cancel
Apply

2. Click the Windows Setup tab. The Windows Setup options will be displayed:


Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.
Components:
Accessibility Options 0.3 MB
Accessories 16.7 MB
Communications 1.4 MB
Disk Tools 1.1 MB
Microsoft Exchange 4.5 MB
Space required: 0.7 MB
Space available on disk: 599.0 MB
Description
Includes options to change keyboard, sound, display, and mouse behavior for people with mobility, hearing and visual impairments.
1 of 1 components selected
Details...
Have Disk...
OK
Cancel
Apply

3. Highlight Communications and click Details.

The Communications dialog box will be displayed:


Communications
To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.
Components:
Dial-Up Networking 0.4 MB
Direct Cable Connection 0.5 MB
HyperTerminal 0.5 MB
Phone Dialer 0.2 MB
Space required: 1.0 MB
Space available on disk: 397.9 MB
Description
Enables you to connect to other computers by using a parallel or serial cable.
Details...
OK
Cancel

4. Click a check into the Dial-Up Networking and Direct Cable Connection options. Then click OK in this dialog box. Also click OK in the Windows Setup dialog box.

Depending upon the configuration of your system, you may be prompted to insert the Windows 95 CD-ROM or floppy disk. However, the software is included on the Display Station's hard disk.

Appendix D Interrupt Requests

CAUTION

For most applications an IRQ cannot be shared by more than one resource. If more than one resource is set to the same interrupt, the application may not respond properly and could cause your machine to lock up.

Note

We strongly recommend that you use only the interrupts that are marked available and use them as suggested.

Table D-1. Contents of IRQ Table

IRQ0	Tick Timer (Cannot be disabled or changed.)
IRQ1	Keyboard (Cannot be disabled or changed.)
IRQ2*	Cascade of the second interrupt controller (Cannot be disabled or changed.)
IRQ3	COM2 (Can use IRQ3 if COM2 is disabled.)
IRQ4	COM1 (Can use IRQ4 if COM1 is disabled.)
IRQ5	Available, suggested for COM3 or secondary parallel port
IRQ6	Floppy disk drive (Cannot be changed.)
IRQ7	Parallel port (Can use IRQ7 if the parallel port is disabled.)
IRQ8	RTC interrupt (Cannot be changed.)
IRQ9*	Available,(Suggested for COM4.)
IRQ10	Ethernet (Do not change.)
IRQ11	Available
IRQ12	PS/2 MOUSE (Cannot be changed.)
IRQ13	Coprocessor (Cannot be changed.)
IRQ14	Primary hard drive (Cannot be changed.)
IRQ15	Available (Suggested for secondary hard drive or IDE CD drive.)

* Some third party boards have IRQ2 as a possible selection. If you choose IRQ2, the interrupt that will actually be used is IRQ9.

Appendix E

Software System Overview

This chapter describes the software that is bundled with the CIMPLICITY Display Station products. Instructions are provided for installing or removing software programs that are included with the Display Station product.

- Windows Software Components E-2
- Enabling/Disabling Automatic Logon in Windows NT E-3
- CIMPLICITY Software Components E-4
- Utilities Disk (Display Station products with Windows 95 software) E-5
- Installing Logicmaster 90 Software..... E-5

Windows Software Components

Windows 95 Software Components

The following table lists all Windows 95 components and indicates whether they have been installed on the CIMPLICITY Display Station.

Component	Installed?
Accessibility Options	Yes
Accessories	Yes
Additional Screen Savers	Yes
Audio Compression	No
Backup	Yes
Briefcase	Yes
Calculator	Yes
CD Player	No
Character Map	Yes
Communications	Yes
Defrag	Yes
Desktop Wallpaper	Yes
Dial-Up Networking	Yes
Direct Cable Connection	Yes
Disk compression tools	Yes
Disk Tools	Yes
Document Templates	Yes
Flying Windows	Yes
Games	Yes
HyperTerminal	Yes
Jungle Sound Scheme	No
Media Player	Yes
Microsoft Exchange	Yes
Microsoft Fax	Yes

Component	Installed?
Microsoft Fax Services	Yes
Microsoft Fax Viewer	Yes
Microsoft Mail Services	Yes
Mouse Pointers	Yes
Multimedia	No
Musica Sound Scheme	No
Net Watcher	No
Online User's Guide	Yes
Paint	Yes
Phone Dialer	Yes
Quick View	Yes
Robotz Sound Scheme	No
Sample Sounds	No
Screen Savers	Yes
Sound Recorder	No
System Monitor	Yes
System Resource Meter	Yes
The Microsoft Network	Yes
Utopia Sound Scheme	No
Video Compression	Yes
Volume Control	No
Windows 95 Tour	Yes
WordPad	Yes

To install additional Windows 95 components or remove installed components double click on **Add/Remove Programs** from the Control Panel. Click on the **Windows Setup** tab. Under the Components section, select a group (such as Accessories) and click on **Details...** to change individual components. Click on OK when you have completed the changes you wish to make. For more information, refer to the Microsoft Windows 95 documentation.

Windows NT Software Components

To add additional Windows NT components (such as a printer driver or an additional Network protocol), enter C:\I386NT as the path for the Windows NT distribution files. For more information, refer to the Microsoft Windows NT documentation.

Enabling/Disabling Automatic Login in Windows NT

You can set up Windows NT to automatically log on by storing a default User and Password into the Registry database. Use the Registry Editor (REGEDT32) to set up the automatic login as follows:

- Start REGEDT32 and locate the following key:

HKEY_LOCAL_MACHINE\SOFTWARE\MICROSOFT\WINDOWS NT\CURRENTVERSION\WINLOGIN

- Establish your domain name, account name and password by adding the following values using the Add Value option under the Edit menu:

  DefaultDomainName

  DefaultUserName

  DefaultPassword

- For each of the above, the Data Type selected must be REG_SZ. Note that the default password may not be blank.
- Add the additional value AutoAdminLogon with a Data Type of REG_SZ and a value of 1.
- To disable automatic logon, set the AutoAdminLogon value to 0.

Note

If the user defined for automatic logon does not have administrative privileges, you must plan to make administrative changes to the Display Station for another system over a network connection. Windows NT does not allow unauthorized users to modify the registry to disable automatic logon. Likewise, other administrative changes, such as setting the CIMPLICITY startup parameters, will be unavailable. To disable the automatic logon, log on to the remote system, run REGEDT32, and pick Select Computer... from the Registry menu.

CIMPLICITY Software Components

The following table lists all CIMPLICITY components and indicates whether they have been installed on the CIMPLICITY Display Station.

Component	Installed?
Base System - HMI	Yes
Base System - Viewer	No
Base System - Server	No
Base System - Demo	Yes
SNP Communications	Yes
TCP/IP Communications	Yes
MODBUS RTU Communications	Yes
Data Logging	Yes
Trending	Yes
Basic Control Engine	No
Point Management API	No
Alarm Management API	No
Device Communications Toolkit	No

To install additional CIMPLICITY components, click on Setup in the C:\I386 directory. Refer to the CIMPLICITY Base System user's manual (GFK-1180) for more information.

Note

Your CIMPLICITY Display station is licensed to run the options provided with the systems. You should not install or run the Server option since it cannot be run without installing the appropriate license.

Utilities Disk

A utilities disk that contains the following files is provided with Display Station products:

CRT.COM and STN.COM	Executable files that allow you to switch between the internal Flat Panel display and an external CRT monitor. (Only one of these displays can be active at a time.) For instructions on the use of these files, refer to "Setting Up External Display Operation" in Chapter 6. (A:\GEFUTIL directory)
Touch Screen Driver	If you are unable to reload the touch screen driver from the hard disk, you will need this file to restore touch screen operation. For installation instructions, refer to "Enabling Touch Screen Operation" in Chapter 10. (A:TOUCH directory)
Glide Station Mouse Drivers	If you are unable to reload the Touch Pad mouse driver from the hard disk, you will need this file to restore operation. For installation instructions, refer to "Enabling Touch Pad Mouse Operation" in Chapter 10. (A:\GLIDE directory)

Installing Logicmaster 90 Software

To install Logicmaster 90 software on the Display Station, first reboot under MS-DOS:

1. In the Start menu, click the Shutdown icon. The Shut Down Windows dialog box will appear.
2. Select Restart the computer in MS-DOS mode and click Yes.
3. Remove write protection from the Logicmaster 90 disk.
4. Insert the Logicmaster 90 disk into the Display Station's floppy disk drive.
5. Type **a:\install** and press **ENTER**. Follow the installation instructions provided by the software. For more information, refer to the Logicmaster 90 documentation.
6. When the software asks if you want it to automatically modify CONFIG.SYS and AUTOEXEC.BAT files, type **N** (no).

Appendix F Specifications

This appendix summarizes the design, electrical, and physical specifications for the CIMPLICITY Display Station. Specifications for the touch screen, keypad, and Touch Pad mouse are also provided.

- Physical Specifications F-2
- Functional Specifications F-3
- Environmental Specifications F-4
- Touch Screen Specifications F-5
- Touch Pad Mouse Specifications F-6
- Keypad Specifications F-8

Physical Specifications

Table F-1. Touch Display Physical Characteristics

Front bezel	Height	11.88 in./30.18cm
	Width	13.00 in./33.02cm
	Thickness	0.25 in./0.63cm
Enclosure	Height	10.88 in./27.64cm
	Width	12.00 in./30.48cm
	Depth	5.06 in./12.85cm
Weight, entire unit		14 pounds/6.4 kg

Table F-2. Touch Station/Glide Station Physical Characteristics

Front bezel	Height	14.00 in./35.56cm
	Width	17.00 in./43.182cm
	Thickness	0.25 in./0.63cm
Enclosure	Height	13.00 in./33.02cm
	Width	16.00 in./40.64cm
	Depth	5.06 in./12.85cm
Weight, entire unit		18.5 pounds/8.4kg

Note

For installation, allow 2 inches (5.1 cm) depth for the power cord that is provided with the Display Station. If you don't have this amount of space, a lower profile power cord that requires less space can be purchased.

Functional Specifications

Table F-3. Display Station Functional Specifications

Item	Specification
CPU	486DX2-66
Memory	Depending on configuration, either one 16MB SIMM or two 16MB SIMMs
Color Display	10.4 inch flat panel, High Brightness Color Display
Display backlights	two
Display Contrast	Adjustable
Display - misc.	Anti-glare screen, choice of 16 or 256 colors via Windows utilities (16 colors only on 32MB units)
Display memory	512KB DRAM
Real Time clock	Yes - with included battery
Hard Disk	> 500MB, IDE
Floppy drive	1.44MB 3.5 inch - access as defined below
Communications ports	COM1 = RS-232, COM2 = RS-232 / RS-422 / RS-485, 115 KBPS max. (COM1 port is not available for use on the following models: IC751ATS350, IC751BTS350.)
Parallel port	Standard bi-directional LPT1 port
Keyboard port	Yes — AT compatible (PS/2 type, 6-pin Mini DIN connector)
Ethernet port	Yes — NE2000 compatible, 10 base T, and AUI
VGA port	Yes — on board, use optional
Mouse port	PS/2 compatible mouse port built-in
ISA boards (Glide Station and Touch Station units only)	ISA boards installed in Glide Station and Touch Station units cannot exceed the following power draws: 1.0A at +5V 0.64A at +12V 0.43A at -12V
Power requirements, general	90—265VAC 47—63Hz 1A rms input current at 120VAC 0.5A rms input current at 240VAC 20A max. inrush current at 120VAC (full load) 40A max. inrush current at 240VAC (full load)
Power consumption Touch Display Touch Station/Glide Station	light operation: 25W full load: 40W light operation: 25W full load: 40W

Environmental Specifications

Note

The unit's nonoperating and shipping temperature range exceeds the operating temperature range. If the product is at a temperature outside the operating range, you should allow the unit to stabilize at the operating temperature for eight hours before applying power to the Display Station system.

Table F-4. Display Station Environmental Specifications

Shock	Operating: Nonoperating:	10G, 11ms, half-sine 50G, 11ms, half-sine
Vibration	Operating: Nonoperating:	0.25G 1G
Relative humidity requirements	Operating (non-condensing): Nonoperating:	10%-85% 10%-85% (40°C maximum wet bulb)
Temperature requirements	Operating: Nonoperating: Maximum temperature rise	0—45°C -20—60°C 20°C (68°F) per hour
Maximum unpressurized altitude	Operating: Nonoperating:	10,000ft (3,048 m) 30,000ft (9,144 m)

Touch Screen Specifications

General Features

- Adjustable filtering for noisy environments
- Adjustable sampling rates from 60 to 180 points per second
- 10 bit A/D, for resolution of 1024x1024 points for both X and Y axis
- Low power operation
- Scratch resistant surface finish
- Anti glare surface
- EMI/RFI shields

Protective Film

The Touch Screen is covered by a polyester film that provides protection against solvents, dust, and moisture.

Caution

The protective film covering on the Touch Screen is *not* resistant to the following chemicals:

Concentrated mineral acids
Concentrated caustic solution
Benzyl alcohol
Methylene chloride
High pressure steam at over 100°C

Caution

The protective film covering on the Touch Screen is *not* suitable for use in conditions of prolonged exposure to direct sunlight. (Exposure to sunlight through window glass will not harm the protective film.)

Caution

Do not use abrasive products to clean the Touch Screen. Do not allow cleaning agents that contain ammonia to remain on the Touch Screen. These products could damage the protective film on the Touch Screen.

Table F-5. Touch Screen Protective Film Specifications

Property	Characteristics	
Chemical	Resistant to:	Alcohols Dilute acids Esters Hydrocarbons Ketones Household cleaning agents
Mechanical	Switch life	More that 5 million flexes
Physical	Pencil hardness	2H

Touch Pad Mouse Specifications

Operating Specifications

X/Y position resolution	500 points/inch (20 points/mm) graphics tablet mode
Interface	PS/2 (compatible with Microsoft mouse driver)

Cleaning

To clean the surface of the Touch Pad Mouse, use rubbing alcohol or ammonia-based glass cleaners. Dampen a cloth with one of these solvents, and wipe it across the Touch Pad Mouse surface. Remove any solvent left on the surface of the Touch Pad mouse using a dry cloth.

Protective Film

The Touch Pad Mouse is covered by a polyester film that that provides protection against solvents, dust, and moisture.

Caution

The protective film covering on the Touch Pad Mouse is *not* resistant to the following chemicals:

- **Concentrated mineral acids**
- **Concentrated caustic solution**
- **Benzyl alcohol**
- **Methylene chloride**
- **High pressure steam at over 100°C**

Caution

The protective film covering on the Touch Pad mouse is *not* suitable for use in conditions of prolonged exposure to direct sunlight. (Exposure to sunlight through window glass will not harm the protective film.)

The overlay withstands exposure of more than 24 hours duration under DIN 42 115 Part 2 to the following chemicals without visible change.

Ethanol Cyclohexanol Diacetone alcohol Glycol Isopropanol Glycerine Methanol Triacetin Dowanol DRM/PM	Formaldehyde 37%–42% Acetaldehyde Aliphatic hydrocarbons Toluene Xylene White spirit	1.1.1. Trichloroethane (Genklene) Ethylacetate Diethyl ether N-Butyl acetate Amylacetate Butylcellosolve Ether
Acetone Methyl ethyl ketone Dioxan Cyclohaxanone MIBK Isophorone	Formic acid <50% Acetic acid <50% Phosphoric acid <30% Hydrochloric acid <36% Nitric acid <10% Trichloracetic acid <50% Sulfuric acid <10%	Sodium hypochlorite <20% (Bleach) Hydrogen peroxide <%25 Potassium carbonate Washing powders Fabric conditioner Ferric chloride Ferrous chloride Dibutyl phthalate Dioctyl phthalate Sodium carbonate
Ammonia <%40 Caustic soda <%40 Potassium hydroxide <%30 Alkalicarbonate Bichromate Potassium ferrocyanide/ferricyanide Acetonitrile Sodium bisulfate	Cutting oil Diesel oil Linseed oil Paraffin oil Blown castor oil Silicone oil Turpentine substitute Universal brake fluid Decon Aviation fuel Petrol Teepol Water Sea water	

Keypad Specifications

Keyboard technology	double dome membrane switches with Autotex 2 overlay
Overlay	Overlay is significantly better in terms of solvent resistance, strength, durability, and toughness compared with polycarbonate and vinyl. Overlay chemical resistance tested to DIN 42 115 Part 2.
Performance specifications (based on manufacturer's test results)	> 1 million cycles before dome failure > 1 million cycles before Autotex 2 overlay failure > 1 million cycles before actuator failure.

Caution

The overlay is *not* resistant to: **Concentrated mineral acids**
Concentrated caustic solution
High pressure steam at over 100 degrees C
Benzyl alcohol
Methylene chloride

The overlay is resistant to the following substances (24 hours under DIN 42 115 part 2):

Ethanol	Acetaldehyde	Flurochlorohydrocarbons
Cyclohexanol	Aliphatic hydrocarbons	Perchloroethylene
Glycol	Gasoline	1.1.1 Trichloroethane
Isopropanol	Toluene	Trichlorethylene
Glyperine	Xylene	Ethylacetate
Methanol	Benzene	Diethyl ether
Acetone	Formic acid, < 50%	Sodium hypochlorite, < 20%
Methyl ethyl ketone	Acetic acid, < 8%	Hydrogen peroxide, < 25%
Dioxan	Phosphoric acid, < 30%	Potassium carbonate
Ammonia, < 2%	Hydrochloric acid, < 10%	Washing powders
Caustic soda, < 2%	Nitric acid, < 10%	Fabric conditioner
Alkalaicarbonate	Cutting oil	Paraffin oil
Bichromate	Diesel oil	Blown castor oil
Potassium ferrocyanide/ferricyanide	Linseed oil	Silicone oil
		Turpentine substitute

The overlay also withstands DIN42 115 part 2 exposure of 1 hour to glacial acetic acid.

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